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SILVER DOLLARS.—III.

We have received, among other comments upon our former articles on this subject, a communication from "A Republican" out West, which forcibly illustrates the confusion of thought into which hard times, a little knowledge, and a great many peripatetic demagogues have brought many sincere people. This correspondent informs us, to begin with, that we are "evidently a paid advocate of the capitalist." The assertion that we have "evidently" been paid is a compliment, though a mistake, since it implies that our argument has some value. The advocate of the capitalist we certainly are, since it is the present sad condition of the capitalist which cripples industry. The laborer is ready and willing to work; but until capital will again resume the activity of production and trade the laborer waits in vain. If our friend thinks that by abusing or oppressing the capitalist he would be able to relieve the laborer, he had better learn the alphabet of political economy.

In a somewhat incoherent letter, "A Republican" proceeds to say that what most of the people want is a silver dollar, made equal in value with the gold dollar, and legal tender to any amount. He argues, first, that there is not, and will not be in five years, gold enough in the Treasury to resume specie payments on the basis of that metal; but with one hundred millions in silver dollars, together with what gold we may have, the thing can be done; because, when people know that they can have the coin if they want it, they will prefer to keep the paper, which is more convenient. If this proposition were correct, there would be no difficulty in resuming on gold alone. But it is not correct, for the simple reason that the currency of the country is inflated and redundant. There is more of it than the business of the country needs; and the plethora cannot be relieved by exportation, as would be the case if the currency had value abroad. This condition of affairs can be cured in three ways only: either by a rise in prices, or by the growth of business until the volume of the currency is not too large, or by the contraction of the currency. The first alternative is not practicable; and, if it were so, would only bring about a recurrence of the evils under which we groan. Experience has shown that an inflated currency, though it may contribute to a rise in prices, will not maintain them. At the present time, this country, with more currency *per capita* than any other, finds that mere currency has no power to create business or maintain prices.

The second alternative, that of *laissez faire*, is the course which has practically been pursued hitherto, with slight alternate fevers of expansion and chills of contraction. It is too slow a process. In fact, it scarcely seems sometimes to advance at all. While we wait for the country to "grow up" to our inflated currency, the currency is actually paralyzing the growth we desire.

The third alternative only is left—contraction, in some form, is absolutely necessary. The greenbacks are a debt. So much of them as the people really need for the transaction of business, they would continue to use, if specie payments had been resumed. The rest of the debt must be paid or funded. That is the whole story.

Now, shall it be paid in gold alone, or in silver also? That is a matter of little consequence to the creditor (however wise or unwise it may be for the Government) if the silver is really of equal value with the gold. "A Republican" says it must be "made" so, by which we suppose he means that the Government should *say* it is so, and command all creditors to consider it so. But this would not "make" it so, either really or for the purposes of business. A practical illustration lies near at hand. By an accidental oversight in the law, the silver trade-dollar, intended to be used in our Asiatic commerce, was made a legal tender. This coin, be it remarked, contains more silver than the "dollar of our fathers," and at the time of its first coinage was worth more than the gold dollar. While this relation of value continued, the trade-dollar went quietly to Japan and China, and was scarcely heard of at home. But when silver had declined in value until the trade-dollar was worth less than the gold dollar, the Pacific Coast was deluged with trade-dollars. The result was immediate and plain. In spite of the fact that the trade-dollar had been "made equal in value" to gold by the law, dealers refused to receive it, and when this course proved futile they established a premium on gold; and the despised silver dollar took its place with the greenbacks as a currency worth less than its nominal value. This experience is not a year old.

Now, if the fiat of the law could not keep the trade-dollar in circulation at par with gold, is it likely to succeed any better with a dollar of still lighter weight?

But it may be said that the Government should make a silver dollar that is actually equal in value to the gold dollar. This we believe to be impracticable while the relative value of the two metals is subjected to such fluctuations as have characterized its recent history; and, moreover, no such relation can be maintained, except by an agreement among commercial nations which does not now exist, and is not within the reasonable anticipations of thoughtful men. But it is scarcely necessary at present to discuss this proposition. What the silver dollar party demands is the silver dollar "of our fathers," which is not worth a dollar. This is not the way of honor, so far as existing debts are concerned; nor is it the way of stable prosperity for the future. As for specie payments, this device of paying in specie ninety cents on the dollar is a trick which can scarcely delude anybody. Even if the Government had the power, by technical construction of law or by main force, to pay bonds and Treasury notes in depreciated dollars, the measure would be unworthy of it, and sure to affect injuriously the public credit. The compromise measure of Secretary SHERMAN itself is not free from this taint. To offer to a man who holds the promise of the Government on a dollar greenback his "free choice" to keep that promise still or surrender it for ninety cents, more or less, is not "redemption," though it be not quite damnation.

TWO BONANZAS ON MANHATTAN ISLAND.

The true sign of provincial manners is the disposition to make a fuss about everything. The *nil admirari* spirit is metropolitan. Witness the quiet manner in which two silver-bearing *bonanzas* have been worked out on Manhattan Island, either one of which furnished precious metal enough to start a "stampede" in any district west of the Missouri River, or quicken the blood of staid Massachusetts (in the neighborhood of Newburyport, at least), or put a soul behind those ribs of death, the railings of the Mining Stock Exchange.

The first of these extraordinary deposits was discovered on Bond Street, near Broadway. Though (like many other famous silver mines, both of ancient and modern times) somewhat irregular, it was nevertheless included between well-defined walls. The country rock, masses of which appeared to have fallen into the vein or chamber, presented the traces of an originally regular stratification; but the lines of bedding were almost obliterated by the action of heat, leaving a brecciated structure. The deposit was thus unmistakably of igneous origin, though the action of water was also clearly evident; and, indeed, both agencies could be seen, still in operation; for at certain points cold water was flowing, and coming into hissing contact, before the observer's eyes, with glowing argillaceous and argentiferous *breccia*. The ore was curiously complicated and variegated in character. Metallic silver, in plates, wires, and other shapes, associated or even alloyed with copper and other base metals, sometimes even inclosed in masses of iron, and occasionally coating the baser metals in a thin, pure layer, was the principal valuable product of the mine. But gold in similar association also occurred.

This *bonanza* was for a few weeks very productive. It was worked by the well-known French method *par gradins renverses et gradins droits avec remblayage*, and yielded, it is said, several hundred thousand dollars before a cement floor was reached, beneath which, as the proprietors declared, the argentiferous mass did not continue. At all events they discontinued operations, dismissing a considerable number of men, carts, and horses, and declaring their intention to use the excavation already made as a cellar for a new building. There was little excitement over the operations. In fact the owners of this remarkable deposit did not seem to be elated. One of them remarked that they had put more money into the thing than they would ever get out of it, and when the true igneous character of the formation was mentioned to him by way of consolation, he indulged in what might fairly be called an igneous exclamation on the subject—an exclamation in which strong theological bias and emphatic contempt for science were tersely blended.

That this *bonanza* was not discovered earlier is doubtless due to the existence of buildings on the site. It was not until the last of these, occupied by the Gorham Company, TAYLOR, OLMSTED & TAYLOR, and other large manufacturing jewelers, was destroyed by fire, that the treasure beneath it became accessible. We do not assert that anybody burned the building in order to get at the mine, though "history repeats itself," and the veracious narrative of CHARLES LAMB concerning the origin of roast pig furnishes a suggestive parallel to this case. We have no doubt that many other jewelry houses of the metropolis, if burned down, would be found to be underlain by *bonanzas* of precious metals. Whether the operation would pay depends upon questions of an economical character, such as the bimetallic standard; the condition of trade; and the amount of insurance, which we will not here discuss.

The second *bonanza* to which we refer was discovered on Independence Day in Spring Street; where the earth of an old cellar was found to be impregnated with silver, slightly alloyed with copper. Whereas in the Bond Street *bonanza* the freaks of nature seemed to have left upon the metal strange resemblances to forks, vases, and other household utensils, the Spring Street deposit yielded a material which, under a simple process of dry jigging, produced what seemed, upon "macroscopical" examination, to be Spanish quarters and American half-dollars. Our reporter visited the locality with a microscope for the purpose of applying to the formation the latest modern tests, according to VOGELSANG and ZIRKEL; but many small boys, policemen, and representives of the daily press had been upon the spot already, and it is perhaps superfluous to add that the microscope discovered nothing whatever. In fact, this *bonanza* was so quickly worked out that there was not even time to put the mine on the market—a most unusual state of affairs, and one which could scarcely have come to pass in a community more thoroughly acquainted with what may be called the Arts of Mining.

It is worthy of note that in this remarkable case nature, while imitating exactly the coins we have named, did not, according to any report which we have seen, produce the semblance of a single silver dollar. This circumstance justifies the suspicion that the silver "dollar of our fathers" was not so deeply rooted in the constitution of things as its present advocates would have us believe.

COPPER METALLURGY IN JAPAN.

A brief article in the *Berg- und Huttenmannische Zeitung*, by UWAO IMAI, of Freiberg (a Japanese student at the Mining Academy, we presume), gives an interesting account of the early copper metallurgy of the Japanese, taken from an old Japanese manuscript, the date of which Mr. IMAI does not give, but which he seems to consider as belonging to the seventeenth century. He points out as noteworthy that, although the ancient Eastern practice was the outgrowth of blind experiment, without scientific knowledge, the method adopted nearly coincides in principle with that of the reverberatory process of Europe.

The ores treated contained silver and lead besides copper, and sometimes antimony and native copper. The following description of their treatment is translated from the German of Mr. IMAI, for which he vouches as a literal version of the original:

"The procedure in reduction varies, for there is copper which can either be forged or cast. That which contains silver and lead is of soft nature, and is hence forged into sheets and drawn into wire. With antimony, it is harder and brittle, and cracks in forging, wherefore it is suitable neither for sheet nor wire. When lead and tin occur in the copper, it is called karakane (bronze), and used in casting bells and for mirrors.

"The ores, roasted in heaps, are charged alternately with charcoal into a hearth, which is supplied with blast by means of two bellows. A workman occasionally stirs the charge, and draws off the slag, whereupon the molten matter which has been formed is sprinkled with water, and taken from the hearth in cakes.

"The extraction of the copper from the matte takes place in a similar hearth; only, the charge is covered when the materials have become molten. After drawing off the slag the black copper is removed from the hearth. This the private works were not in those days permitted to trial further, being obliged to deliver it to the copper works at Oosaka, where it was refined and sent to Nagasaki for barter. The black copper was remelted, according to its fineness, once or twice in crucibles, and tapped, after the removal of the slag, into molds filled with boiling water, where it was then cooled with cold water.

"Still earlier (in the sixteenth century) it was not practicable to extract silver from copper; but subsequently a native of the province of Isumi, by the name of SUMITOMO SIUSEI, learned from a foreigner the following process of desilverization: The copper is smelted with lead, the slag drawn off, and an iron bar plunged into the bath. The alloy which clings to this bar, containing 80 per cent. of copper and 20 per cent. of lead, is treated by eliquation, and the eliquated lead is cupeled in a rude furnace upon a hearth of ashes."

A NEW STATE—SAN JUAN.

Staff Correspondence of the Engineering and Mining Journal.

There appears to be a strong agitation in Northern New Mexico and Southern Colorado on the subject of the formation of a new Territory. The former district is wearied of its Territorial condition; the latter is as tired, professedly, of its Statehood. The various newspapers, from the Arkansas River down to Santa Fe, are urging the change; and not a little is expressed in favor of the move by prominent citizens of the two States. It is proposed to cut off a strip from Colorado, about 75 miles in width from north to south, and nearly an equal amount from New Mexico. The area of the new Territory, which would be called San Juan, Raton, Cimarron, Santa Fe, or Taos, would thus be about 60,000 square miles, and would contain two well developed and growing silver districts, Rosita and San Juan, two fine gold districts, the Moreno and Summit mines, and the finest area of coal lands yet discovered in the West, viz., the Cañon City and Trinidad basins. Its resources, therefore, would not be insignificant, and the comparatively small size of the community, though in reality as large as the whole of the New England States, would be much in its favor.

While it is difficult to give good political reasons for such a subdivision—because it is evident that local jealousies are at present the prime incentives to the movement—yet there are good geographical causes for such a change. As the West is opened and its resources come under the notice of emigrants and capitalists, advantage has always been gained by the segregation of adjacent fields of labor under separate governments. In large communities the dissatisfied minority becomes an important dissenting faction, never to be fully satisfied, never to be conciliated even, except at a very heavy cost. The more settled portions of such a community always claim and receive the most attention from the local government, while the sparsely settled districts are treated rather shabbily. The result of such a course is always the granting of undue benefits to the richer parts of the State, which do not need help, and a corresponding neglect of the outlying and less developed sections, which most need governmental assistance.

In Colorado this condition of affairs is particularly evident. The northern part of the State, under the incentives of direct Eastern connections and a vigorous, energetic emigration, is at least ten years in advance of the southern districts. There is also a sharply defined line of demarcation between the two geographically. There is a difference in the mines and in the people; a change, also, in the climate and life. Northern New Mexico will more closely assimilate itself to the Arkansas Valley country than will ever be possible with Northern Colorado. The southern part of the State is new in almost every way. It has its own new road and new mining districts, and is opening the latter wholly on the basis of the improved Mining Act. In another decade the divergence of the two sections will be even greater than at present, and will ultimately compel separation.

It is not difficult to show how the immense areas of our Western States and Territories have operated more or less against their rapid development, or, at least, against the opening of their more remote districts. Patriotism is one thing, and State pride is another; neither is truly advanced by the creation of large and dissatisfied minorities. Wherever in any part of the West—excepting only those States bordering directly on the Pacific, which are not compelled by legislative acts to sacrifice their geographical position at the desire of a more advanced district far away from them—new and remote mining districts have been opened within the huge limits of our great Territories, unfair advantage has been taken of the necessities of the young communities by the wealthier and older sections. This is seen very clearly in the history of Southern Nevada, Southern Idaho, Eastern Montana, and Northern Wyoming. Each of these Territories needs subdivision, and will be benefited by it. Colorado is in exactly the same position. The southern part of the State is of no advantage politically to the northern half. No commercial ends are subserved by keeping them together. On the other hand, a positive advantage is gained by the district in question by separation. Its mines, which are now developing with extraordinary rapidity and success, will be brought more prominently before the country. It will be in a position to help itself by such legitimate legislation as is needed by any growing community, and which it cannot obtain at present, nor so long as the northern half of the State exceeds it in richness and commercial power.

We would, therefore, be glad to see the erection of the new Territory of San Juan, or Cimarron, or whatever it might be called. We should like to see a corresponding State formed out of the Black Hills; the expenses of the national government would be increased, of course, but the greater rapidity of development would far outweigh any such consideration.

ABOUT ORE REDUCTION.

Staff Correspondence of the Engineering and Mining Journal.

In the JOURNAL of June 16 we commented to some extent on a new tellurium process. The author of the process has honored us with a reply which he requests us to publish. After looking over it carefully we believe that in not complying with this request we do the author a service. If our correspondent will substitute some actual facts and figures which can be verified for mere conjectures, we will be pleased to give him a hearing.

We know from personal experience that a number of those who are struggling to discover some new way of reducing our low grade ores, are thoroughly honest in their work, and thoroughly convinced that they are working on the right track. Similarly there are honest men who are spending their lives in trying to accomplish perpetual motion or the transmutation of elements. In neither case, however, is their purity of motives of anything but a negative credit to them. They attempt more than they should. They have not the knowledge to attack the subject, and fail invariably because the foundation on which they build is faulty and rotten. We all of us feel a hearty sympathy for the man who has fallen and broken his leg or crushed his ribs, or otherwise injured himself; but would not the universal voice condemn the spectator at such a tragedy who, instead of hastening for the surgeon, should draw out his pocket knife and commence to hack away at the sufferer after his own ignorant and untrained fashion? And

yet this is exactly what many of our process men are doing. Without any groundwork of knowledge or experience to build upon, without even a smattering of the subject in hand, they do not hesitate to attack a question which is as completely beyond their limit as would be a difficult point in law or a delicate operation in surgery. Frequently, with heroic yet foolish pluck, they freely expend their own time, labor, money, and energies in the task. Again, with less honesty of purpose, they induce others having money to take the chances with them. And the whole country from the base of the mountains to the Pacific is strewn with their wrecks.

It is the fashion of these inventors and discoverers to decry the well established metallurgical systems, and to point to the hundreds of ruins to be found everywhere in our mining districts as proofs of their statements. These wrecks do, unfortunately, exist; but it is to be remembered that their failure was caused, not by the incorrectness of the process *per se*, but because either the wrong system was adopted, or the man who put up the works was incompetent or dishonest. These two cases are very thoroughly illustrated on the Pacific Coast. Go into any of our silver districts, and one will find scores of gold mills put up to treat silver ore; smelting works are found where that system was not needed and would not answer; milling works, where the ores could not possibly be milled. These are simply cases of bad judgment, stupidity, criminal carelessness. He who is doing the country most injury now is not the thoughtless, careless mill superintendent who builds works unsuited for the conditions and mineral he has to work on, but the man who, with no knowledge whatever of metallurgy, concocts a furnace or mill that will not treat *any* class of ore—not even the pure metal.

It is easy to illustrate, and, by looking over some of the process literature which comes to our Western Office, we may show how little in the way of real progress and advance is to be expected from these inventors and discoverers.

From one man the idea is advanced that the gold in tellurium ores is in a state of sublimation. The proof given is this: "Tellurium will volatilize at a low temperature, and the gold goes with it, consequently it is in the same condition." This is begging the whole question. The discoverer certainly does not know what sublimation is. Even if the cases are parallel, he must first prove that tellurium is in a "state of sublimation" before he can assume that the gold is also. As it happens, however, the tellurium is not in that state, as is proven by the very fact that some of the gold goes off with it. If it were, it would go off alone, for sublimation is essentially a process of separation, and the fact that the two elements volatilize to some extent together shows clearly that they exist in chemical combination.

Again a writer says: "From 30 to 90 per cent. more gold can be obtained by the crude California assay than by the free assay." This is absolutely untrue. One hundred per cent. of the gold may be obtained by any careful and competent assayer. The trouble with our correspondent is that the does not know how to assay. Tellurium ores are being bought and sold daily at Boulder County, Colorado. Does he suppose the buyers do not know what they are purchasing, or that sellers let their mineral go on a method of assay that would vary from 10 to 70 per cent. of the truth? The idea is, of course, puerile. The "California assay" our correspondent describes as "wasting at a red heat in a pan, and then amalgamating." A good enough process, it is true, but, if the tellurium is in a state of sublimation, would it not carry off some of the gold? We know, however, that no sane Californian, or any one else, would adopt such an absurd method of assayer.

Another correspondent urges that the existence of "slickensides" proves that the mineral in veins comes from below. We agree with his conclusion, but not for the reason he gives. An examination of a number of veins will show him that these striations on the walls as frequently point downward as upward, and again lead sidewise. They simply show a movement between the walls, and in the same vein these movements at different places are often in different directions.

Again, another gentleman claims that, because analysis has shown gold in a state of suspension and solution in the water of creeks into which mill tailings flow, and because fine scale gold is found to float, hence it is folly to attempt to concentrate by water. There can be but one answer to such a position, and that is a reference to the hundreds of companies all over the West who *are* concentrating gold ores by water, and who probably will continue to do so in the future, as they find that it does actually pay.

It would be a waste of time to refer to these points were it not for the fact that many honestly-minded men all over the West are losing their time, money, and energies in inventing processes which invariably fail; and many capitalists have been induced to invest their means in testing these productions. Repeated failures affect the whole industry unfavorably. They give it a bad character, and deter many from investing who, if there were any signs of success, would be with us. Perhaps the worst feature of the mania is the fact that many local papers deem it their duty to encourage every "process sharp" who approaches them with the merest shadow of an idea. It would be as consistent to help along the quack doctors. No results of any value are to be expected from untrained experiment; guesswork will solve none of the practical metallurgical problems before us. The science is an exact one, and demands the highest skill and a correct knowledge of the chemistry of minerals. He who attempts to produce something new in the way of a furnace or a process, without previously making himself thoroughly acquainted with the conditions to be met, is simply wasting his own time and the means of those who rely on him.

SUMMER TRIPS AMONG THE MINES.—No. 2.

Staff Correspondence of the Engineering and Mining Journal.

It requires but a few years to wipe out even the memory of a deserted mining camp. Eight or ten years ago Empire held a population of nearly 3,000 miners. To-day it would be difficult to find fifty in the upper and lower town together. And yet the mines are still here.

The south fork of the Colorado Central Railroad has now completed its grade within a mile of Georgetown, and by the time this is in print the workmen will, no doubt, be in that flourishing little silver mining town. Empire lies off the line of the track about one mile, and is only three miles distant from Georgetown, by the new road over Union Pass, between Douglass and Democrat mountains. It is a charming little town, in spite of its deserted and rickety log shanties. Situated on a broad and deep bar, just at the mouth of Empire Creek, it commands a fine view of the stately hills to the south and west. By following up the creek for a mile, Upper Empire is reached, from which one may look south over Union Pass, and see the smoky and busy camp of Georgetown in the deep valley beyond. Silver Mountain, on which are located nearly all the mines which gave Empire its prominence in the early day, is crossed upon its eastern slope by about a dozen very large and strong veins of auriferous pyrites, the most noted of which are the Pittsburg, Conqueror, Tenth Legion, Silver Mountain, Livingston, and Empire. On all these the top dirt and quartz were very productive. Sluicing was carried on upon the mountain side, by means of a union ditch, brought in from the head of Mill Creek a few miles away, a number of arastras and stamp-mills were erected, and in a short time the yield of gold had amounted to $200,000. Hard white iron was soon struck, however, and that ended the town and camp for the time. The discovery of rich silver mines at Georgetown furnished a new and more promising field for the miner, and, with a facility for emigration known only to the prospector, the whole working force of the district was in a few months scattered to the south and west in the deep gulches above the Silver Queen.

Last year, when the price of silver fell so suddenly, there was a rush once more for Empire, and for a time it seemed as if the district would spring once more into active life. It was not found possible to market the abundant gold ores, however. They were too low grade to be transported any distance, and too refractory to be worked by stamps. Yet the mines of Silver Mountain are among the largest in Colorado. There is an immense amount of ore in sight, and development enough made on the principal veins to insure a steady yield of fully 150 tons per day, worth, on an average, $30 per ton. Smelting will not answer as a mode of treatment, for the cost is too great; battery amalgamation does not save over 20 per cent. of the gold, and is therefore wholly out of the question. Any one who takes pains to look through this district will detect a good field for milling works. The pure ore consists mainly of iron pyrites, with which is associated some copper pyrites.

Past Empire leads the road to Berthoud's Pass, across the range to the Middle Park, now the Mecca of hunters, fishers, and rheumatics. To the southward a well graded road leads through a lovely little valley about a mile long, between Lincoln and Douglass mountains, into the head of which enters Bard Creek. Looking up this narrow stream, one sees, far up on the slope of Democrat Mountain, to the left, the little collection of miners' cabins called, I believe, Stewartville, which surround the Polar Star, Rogers, Emma, Fletcher, Independence, and other mines. It was on the other or southern slope of this same hill that some of the first silver discoveries of the district were made, but the operators of those days did not have the "bottom and grit" which the miners have now. The Nuckols, Columbia, Mexican, Beecher, Boston, and Astor were quite productive at first, but as soon as barren places in the veins were reached they were deserted. Similar zones of poor ground were encountered in the mines of the northern slope a few years ago, but the perseverance of owners has brought them into pay again, and now there is no part of the Georgetown district doing better, for the amount of development, than the Democrat mines.

A gentle grade past the mouth of Bard Creek, covering a rise of perhaps a hundred and fifty feet, brings the traveler to the top of Union Pass, a little notch between two higher mountains, from which he looks down five hundred feet almost perpendicularly into the deep valley, at whose head, a couple of miles away, lies Georgetown, the silver metropolis of Colorado. Above the town the eye peers into the deep gulches leading up to the Argentines, and sees the marks of the great silver mines which have made the camp. Immediately at the foot of the pass is the railroad grade. In a few more weeks the scream of the locomotive will echo between these tall cliffs, the dusty stage coach will be drawn off, and Georgetown will end its pioneer existence and become a railroad terminus.

A heavy smoke hangs over the Silver Queen nowadays, coming from the tall stack of the Clear Creek Company's works. At the date of writing, also, there are heavy fires in the timber above town and the air is close and murky. Above Clear Lake, and in one of the finest bodies of timber in that section, the fire has been raging for several days. About six miles eastward on Trail Creek there has been also a tremendous forest blaze for nearly a week past. In the two places fully $100,000 worth of timber has been destroyed. All this is due to the carelessness of a few wood cutters. Our ideas of justice out West are on some points rather confused. We hang a horse thief or an ore thief with little or no compunction; but who would think of interfering with the pleasures of the gentle woodsmen, who each year destroy tenfold more property than they can earn for the balance of their lives?

EMPIRE, COLO., July 4, 1877.

TO BE CONTINUED.

FRICTION OF PLAIN SLIDE VALVES.

By John W. Hill, M.E

In the ENGINEERING AND MINING JOURNAL of March 10th, the writer presented an article under above title, which had for its object a concise demonstration of the true friction of slide valves. Without arrogating to himself extra knowledge upon this very important subject, he is aware that not only a wide diversity of opinion exists as to the correct method of estimating the friction, but a great many erroneous ideas prevail upon the expense of power in moving the valve. Having made numerous experiments with valves under steam pressure to determine the accuracy of his views, the writer presumed a *resume* of the facts obtained, presented in the form of an investigation, would be acceptable to engineers and others interested in this class of machinery.

In the *Scientific American* of April 28, Mr. Joshua Rose, in an elaborate article, suggests that the writer's method would be intelligible providing he will tell us his reason "for assuming the coefficient of friction of a slide valve to its seat to be 0·15, and also for assuming it as possible or practicable to make *all* valves of an equally good fit to their seats, and to prevent that fit from varying by reason of the expansion and contraction due to variations of temperature, and by further reason of the springing of the valve from the pressure upon it."

The objections are probably comprehended under the following heads :

I. The coefficient of friction of cast iron on cast iron under the usual conditions existing in the steam chest of an engine under pressure.

II. The fit of the valve to its seat, and the spring of the valve under pressure.

The first objection is really no objection at all, or, what is the same thing, it loses its force when it is understood that there is nothing in the proposed method for estimating the friction of slide valves forbidding the use of any coefficient of friction sanctioned by experience. In the demonstration the writer employed the coefficient that seemed to express the average condition existing in the steam chest of an engine under pressure ; at the same time the argument in behalf of the method is none the less tenable, as it does not depend on the coefficient to be employed. In support, however, of the coefficient 0·15 attention is directed to *Weisbach's Mechanics*, vol. i. page 320, wherein the minimum value of the coefficient for metal upon metal dry is put at 0·15 ; also to *Rankine's Mechanics*, page 613, where he puts the minimum coefficient for metal on metal dry at 0·15. As about all our information upon friction is due to the experiments of Morin, Coulomb, and Hirn, it would be mere repetition to cite other authorities in indorsal of the results of these experiments. Accepting 0·15 as a proper coefficient for metals on metals dry, it remains simply to show the condition of the surface of value and seat under pressure, whether they are dry or nearly so, or well lubricated with unguents. Every steam chest has, or is presumed to have, an oil-feeder attached to it. At intervals of half a day or more, this apparatus, holding a microscopical dose of oil, or other unguent, is filled and the contents turned into the chest. Whilst this oil is passing through the chest into the cylinder, lubrication is probably excellent ; but directly the supply from the feeder is stopped, lubrication ceases, and the friction returns to the ordinary conditions, *i. e.* dry surfaces. It is quite likely that more or less liquefaction is present at all times in the chest, but this, instead of reducing the friction, is neutral (*Weisbach's Mechanics*, vol. i. p. 322). If, then, the oil or other lubricant is not flowing through the chest at a uniform rate, or if it be at a uniform rate and in insufficient quantity, or if the chest be deprived for hours at a time of any lubricant, what then is the probable condition of the surfaces of seat and valve face? It is well known that hot surfaces dissipate oils rapidly, and what would be a fair amount of lubricant with cool surfaces would probably have no appreciable effect when applied to hot surfaces ; and as the custom of the great majority of engine attendants is to lubricate the valve only upon due notice from the valve itself, it is fair to assume the average condition of surfaces to be dry so far as lubrication goes. Mechanics generally are aware that, when the moment of friction is considerably within the limits of abrasion, the slide valve will move upon the seat without apparent distress, and with cast-iron *suitable* for steam cylinders this limit, with our present steam pressures, is never reached.

Whilst accepting the proposition that it is *possible* to so supply unguents to the chest as to justify the use of a lower coefficient than 0·15, the writer is of the opinion that this possibility is seldom realized, and the average condition is equivalent to dry surfaces. It is not disputed that instances will present where it may be necessary to employ a higher coefficient.

The writer is reasonably familiar with what has come to us in Anglo-Saxon of M. Bochet's experiments, together with his formula for correction of the coefficient of friction. It is suggested, however, that the deductions of Bochet have not been accepted as conclusive by scientific men. Weisbach devotes space enough to outline the experiments, and present the proposed law of variation of the coefficient, together with a few examples, and a significant hint that these experiments should be repeated. Of course, if Bochet's reasoning and his demonstrations were conclusive, why the necessity of repeating the experiments? If the law of correction deduced by him be reliable, why should Weisbach hesitate to indorse it? Upon the contrary, in the fourth edition of his *Mechanics of Engineering*, revised *five* years after Bochet's researches were published, this author presents as a fundamental law of friction that "it is independent of velocity; it is the same at all velocities."

Mr. John C. Trautwine, C. E., of Philadelphia, who has personally investigated the friction problem, has no hesitation in writing under the head of "Friction," in his excellent *Pocket-Book for Engineers*, "the coefficient is the same at all velocities."

Mr. John W. Nystrom, in his *Mechanic's Hand-Book*, indorses the Morin and Coulomb law, that "friction is independent of velocity." At the same time, it is doubtful if Mr. Rose would question Nystrom's judgment in a matter of pure mechanics.

The suggestion that we must know the velocity of translation at every point in the travel of valve to estimate the friction, is absurd. Neither does Bochet's formula demand it ; and even were the friction estimated for different velocities, the ultimate reduction would be precisely the same as by a single equation with "V" as the mean velocity. However, if Mr. Rose will furnish an acceptable value for "Y" (as applied to cast-iron smooth surfaces) in Bochet's formula, the writer will work the problem with variable velocity of translation.

Before dismissing the coefficient question, attention is directed to an erroneous quotation from Rankine, where Mr. Rose causes Rankine to say that the equivalent of friction is in "*terms of the weight.*" The correct language of Rankine is, "*Friction is proportional to the force with which solid bodies are pressed together.*" This force may be gravity or pressure, however obtained.

Adhesion constitutes no essential part of the investigation, as this force, compared with the force of friction as induced by high steam pressure, is so small as to be of no practical consequence. There is a disposition upon the part of some people to confound the forces of "adhesion" and friction," whilst in fact they are distinct and subject to different laws. Thus, "adhesion increases with surfaces in contact, and is *independent* of pressure ; per contra, friction is proportional to the pressure, and, within the limits of abrasion, independent of surfaces in contact." Weisbach observes that, when the pressures are great, adhesion constitutes a *very small* part of the friction, and can generally be neglected.

Replying to the second objection: it is nowhere asserted in the original paper that *all* valves have an *equally* good fit. It is assumed, however, that it is *possible* and *practicable* to fit a valve steam tight at all points in the travel. The writer, who has had some experience in this direction, presumes to be able to produce such a fit. The little depressions spoken of are always found in new scraped work, but any steam finding its way into these spaces is probably liquefied by the force of attraction, and ceases to have an expansive power ; and the proposition that these little volumes of water have a neutralizing effect on the load on valve cannot be proven ; besides, these little hollows are quickly worn out by attrition, and are then entirely eliminated from the investigation. The suggestion that the difference between the temperatures of live steam in the chest and exhaust steam in the pocket of the valve produces unequal expansion is quite true. Under this condition the back of the valve or the surface remote from the seat having the higher temperature would undergo the greatest expansion, and the effect would be to make the face of the valve "concave." The suggestion that the pressure on the valve produces a deflection, having a tendency to lift the wings partly from the seat, is likewise theoretically true ; theoretically, because by calculation this deflection is so *infinitesimal* with properly designed valves that it has no practical significance in this connection. Admitting, however, that there is a spring of the valve under pressure, the effect is to make the face (of valve) "convex." Thus it appears that the change of form of valve due to unequal expansion is in one direction ; whilst the change of form by pressure is in an opposite direction, and as the "regimen" of the steam chest under pressure is such as to produce both forces, then one force neutralizes the other, in whole or part. If these forces are *equal*, then no change of form takes place.

On April 27, the writer had occasion to investigate the performance of a 12 by 24 inch slide valve engine, furnishing the power to a furniture factory in Cincinnati. The engine was built nearly ten years ago, and has been in constant operation ever since. The steam chest was opened and the valve taken out to test the accuracy of face, when a careful application of a D. B. & S. straight edge revealed no detrimental wear. Here is a case such as Mr. Rose has cited, *i. e.* the valve has been distorted in one direction by the force of unequal expansion, and in the other direction by unbalanced pressure. Whether the forces were in equilibrium in this special instance is not known. At all events, nothing exists at the end of nearly ten years' constant use to prove that they were not.

If there be any merit in the arguments of Mr. Rose upon the fit of valve and change of form, both are susceptible of ready proof. Let him offer a premium to mechanics to furnish a small steam chest, valve, and seat, each one of which that upon test appears to be steam tight at all points in the travel to be entitled to an award of say $25 or $50. "If the result does not completely extinguish his exchequer, it will be because his fortune is greater than that of newspaper writers generally." The device submitted will be sufficient to demonstrate the accuracy of his views on the second proposition. If the valve "buckles up" from unequal expansion, it will leak steam under the side walls into the exhaust. If it springs from pressure of steam on the back, the moment of friction will be reduced (probably), and can be measured by suitable appliances.

A CARD FROM PROFESSOR SILLIMAN.

By the prospectus of the "Arizona Chief Gold and Silver Mining Company, of New York," very recently placed in my hands, I find to my surprise my description of the "Moss Lode," as I saw it in 1864, cited in furtherance of this scheme. These citations are made from a paper of mine published in 1866, in the *American Journal of Science*, entitled "On Some of the Mining Districts of Arizona, near the Rio Colorado, with Remarks on the Climate," etc., etc. This paper was simply a statement of facts of my own observation respecting the geology, mineralogy, metallurgy, and climate of the regions I visited, and among other noteworthy things I described in some detail the "Moss Lode," one of the most remarkable outcrops of a fissure vein yet observed on this Continent, and visible even from the Colorado River, coursing east and west as a distinct sharply defined crest for at least three miles. A fragment of this paper, with important omissions, is now used to promote the sale of the "Arizona Chief," of which my first knowledge is the statement in this prospectus that it is a claim on the Moss Lode.

I protest against this unauthorized use of my statements of observations made thirteen years since, and now presumably cited as a mining report.

Explorations made on the Moss Lode subsequently to my knowledge of the vein failed, as I am informed, in developing a valuable mine, a fact not mentioned in the prospectus of the "Arizona Chief." B. SILLIMAN.

NEW HAVEN, July 14, 1877.

THE ELECTRIC CANDLE.*

By Alfred Niaudet.

Public attention has been directed to Jabloshkoff's system of electrical light ing by the use that has been made of it at the Magasins du Louvre, in illumina t ing a hall recently opened. Two carbon points, borne on suitable metallic supports, are arranged in one line with their tips in contact. An electric current of high intensity is made to pass into them ; they may become heated, but they will not give out light unless they be separated by a little distance from each other. On separating them, by the hand or otherwise, the voltaic arc appears and gives out a very strong light. This light persists, provided the carbons are a few millimeters apart ; but, as the carbons waste away, the distance between their tips becomes greater, the voltaic arc is lengthened, and soon the light goes out, unless the points are again brought near to each other. Hence it is seen that this rudimentary apparatus cannot support the electric light for over a few minutes, and some contrivance had to be devised for approximating the carbons in proportion as they waste away, and for keeping them a very small distance apart. This is done in the lamps devised by Serrin, Foucault, and others.

When the source of electricity is a pile or a magneto-electric machine with continuous currents, like Gramme's machine, a new difficulty is met with ; for here the two carbons are consumed unequally, the positive one wasting about twice as fast as the negative. On the other hand, machines with alternately reversed currents present this peculiarity, that in them the waste of the two carbons is equal.

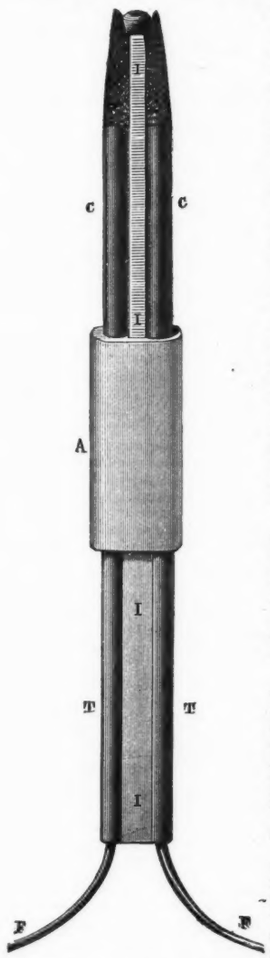
* Translated from the French by J. Fitzgerald, A. M., for the *Popular Science Monthly*.

To whatever grade of perfection such lamps may have attained, they undoubtedly labor under sundry disadvantages. Their mechanism is delicate, and necessitates very great care on the part of those who operate them. It is not very easy to regulate them. Their main bulk, being situated beneath the luminous point, casts an objectionable shadow. As usually constructed, their size is such that they cannot work over three hours without having fresh carbons put in, and this renewal of the carbons necessitates either a temporary interruption of the lighting or else the keeping of an extra machine, which involves an increased outlay of money. Finally, the prices of such machines is pretty high, and can hardly be reduced.

The very great progress made during the last few years in the construction of magneto-electric machines has made more evident the imperfections of the regulating apparatus.

Such was the condition of things when a Russian engineer, M. Jabloshkoff, succeeded in dispensing altogether with the mechanism of electric lamps. Let us see how this lucky inventor has succeeded in overcoming the difficulties that successively arose before him.

First of all, he sets out with the idea that the carbons must be placed side by side, so as to consume them simultaneously without having continually to regulate their respective positions, just as in stearine candles the wick is consumed in proportion to the consumption of stearine. The first requisite is, that the voltaic arc shall be produced only at the tips of the carbons. For this purpose it is sufficient to place between the two carbons a strip of glass, kaolin, or any other insulating substance, somewhat wider than the carbons, and not reaching to their tips. It might be supposed that this insulating substance, while separating the two carbons, would soon form an impassable barrier between the one and the other, and extinguish the voltaic arc by requiring it to make too great a span. But such is not the case ; the high temperature of the voltaic arc is sufficient to melt and even to vaporize glass or kaolin, and thus the insulating septum between the carbons wears away simultaneously with them.



JABLOSHKOFF'S ELECTRIC CANDLE (actual size).—*C C*, carbon-points of gas-coke ; *I I I I*, insulating substance ; *T T*, tubes holding the carbon-points; *A*, socket of asbestos holding the system together ; *F F*, copper wires conveying the electric current.

If the source of electricity gives constant currents, then, inasmuch as the carbons wear unequally, one wasting more rapidly than the other, the distance between the points will become too great, and the light will be extinguished. To overcome this difficulty, we have only to make the carbon that burns most rapidly twice as thick as the other.

It is true that hitherto the electric candle has worked better with magneto-electric machines giving alternating currents, than with piles or Gramme machines ; in the former case the carbons wear away equally, and are of the same thickness.

To complete the description of Jabloshkoff's apparatus, we have to add that each carbon is socketed in a brass tube, connected with a wire coming from the source of electricity. These two tubes are attached to each other in various ways, according to the application had in view ; the one essential precaution is, to take care that they do not come into contact with each other.

The name candle has been very happily applied to this simple apparatus ; it is, indeed, a candle with two wicks burning side by side, and which lower their luminous point as combustion goes on. One interesting peculiarity it possesses, namely, that the luminous point can be turned downward, so that there is nothing to throw a shadow. Its light may be modified by the use of opal or ground-glass shades.

HOW THE CANDLE IS LIGHTED.—One of the principal advantages of Serrin's lamp is that it can be lighted from a distance. The lamp is made ready, say, in the morning, and, when night comes, all that is required is to admit the electric current, and light is instantaneously produced. At first Jabloshkoff lighted his candle directly by supporting on the tips of the two wicks a piece of charcoal which he soon afterward removed ; thus the voltaic arc was produced as in electric lamps, by beginning with contact, and then placing the two carbons at the required distance from each other. But it was necessary to devise some method for lighting the candle from a distance, and this fresh difficulty M. Jabloshkoff has overcome by a very simple device. He places between the two carbons a little bit of graphite, of the diameter used in lead pencils ; this acts as a conductor between the two wicks of the candle. On the current entering it, the bit of graphite soon becomes red hot, and is burned up ; there is then a break of continuity between the wicks, and the electric arc is produced. Instead of graphite a fine metallic wire, or a bit of lead, can be used.

RELIGHTING.—As we have stated, the insulating strip between the wicks is fused at the points near the voltaic arc, and so disappears gradually in proportion to the waste of the carbon points. But this fusion of the insulator is attended with another consequence that but few of our readers would have anticipated. That which in its solid state is an insulator becomes in its liquid state a conductor, and allows of a longer span of the electric arc than could be had in the free air. Owing to this conductivity of the strip of kaolin, the circuit may be opened for a moment and the candle lighted again without any need of resorting to any of the contrivances already described under the head of "Lighting." But after a certain length of time, as the substance cools, it loses its conductivity, and then the candle cannot be relighted by simply closing the circuit again. We may extinguish the candle for nearly two seconds, and relight it by simply closing the circuit. Hence the electric candle may be used for transmitting telegraphic signals according to the Morse alphabet, by means of flashes of greater or less duration, divided by longer or shorter periods of eclipse. For such use the candle is better adapted than the electric lamp, as it is more readily relighted, producing at once a perfect voltaic arc, whereas in the lamp the arc is produced gradually.

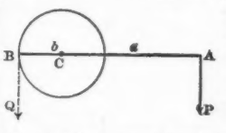
DIVISION OF THE LIGHT.—Hitherto a separate pile, or a separate machine, has been necessary for the production of each electric light, and it has been found impossible to place two lamps in one circuit. This is readily understoon when we consider the mechanism of the regulating apparatus. In electric lamps the approximation and the separating of the carbons are controlled by an electro-magnet, which itself follows the variations of resistance in the circuit produced by changes in the length of the voltaic arc. As the arc lengthens the resistance of the circuit is increased, and the electro-magnet is weakened, and allows the carbons to approximate. It is easily understood that if there are two lamps and two voltaic arcs in one circuit, and if only one of these arcs is lengthened, both electro-magnets will act and shorten the two voltaic arcs. The consequence is, that the second lamp will have its proper working interfered with, while the first alone should have been regulated. In other words, the solidarity of the two apparatus will tend to produce in each unnecessary changes of regulation that will constantly result in causing the system of lamps to work badly. But with the candle there is nothing of this kind, and, provided that the source of electricity possesses sufficient tension to produce the voltaic arcs, many may stand in the same circuit. In the Magasins du Louvre we have seen in some instances four lights, in others three, produced by a single machine. The sequel will show whether we can reasonably expect to see even a greater division of the electric light, and whether this invention may not have still further applications.

LECTURES ON MINING.—No. XLV.

By Prof. W. W. Smyth, M. A., F. R. S., Royal School of Mines, London.

The subject of raising the mineral in the shaft is so large that we can deal only with the principles of the general apparatus which is in use. As long as manual labor is sufficient, the apparatus employed will be the tackle, windlass, or stowce, with usually a round hempen rope, and some sort of bucket to carry the material or to hold the water. In the latter case very commonly a wooden bucket, strengthened with iron, is used. In the case of metalliferous mines, and in the sinking of collieries, a short iron bucket, termed a kibble, is employed, made in several segments and riveted together, with the bottom riveted on in the same manner. Ears are riveted to the side at top for attachment with the rope, and commonly a handle is riveted to the bottom, for the purpose of steadying it as it comes up, and for convenience in emptying it. The kibble is attached to the rope sometimes by special hooks ; in other cases by means of an arch curved round from one side. A safety hook should be employed for suspending the kibble, either with a spring to prevent the kibble being shaken out, or a thong of leather passing through a slot in the end, or else a slot in each part of the hook, with a pair of spring-like pincers passed through. Where a great deal of work has to be done by the windlass, and especially where men have to be lowered by it, a great deal of precaution is necessary. The windlass is very largely employed in works near the surface for ironstone or coal, and also largely in metalliferous mines. In its usual form of construction, it is a very simple piece of apparatus, consisting of a barrel made of a convenient length for a shaft, placed about 30 to 36 inches from the ground, this depending partly upon the custom of the neighborhood and partly on the strength and size of the men. This barrel is fitted with one or more handles, variously placed ; frequently one end is flattened out, placed in wood, and secured by a ring of iron. When the handles are double, it will generally be found that they are placed in the same direction opposite to one another ; so that one is at the summit of its circuit when the other is at its lowest point. The result of this is that a jerk is given to the barrel during the revolution, but this is generally submitted to, and in only a few cases had the lecturer found this obviated by the simple expedient of placing the handles at a different angle, from 90° to 45° apart. The barrel will be from 6 to 10 inches diameter, or larger still under some circumstances, and if wire-rope has to be used, it is very important that the principle on which the windlass works and the amount of work which can be got out of it should be well understood. Where you have a set of people raising water, or stone, or stamp stuff, or material for the stopes, it is very important to know what amount of work may be done in a given time.

In Fig. 33, C B is the leverage from the barrel to which the weight Q is suspended, and P is the power acting at the extremity of the arm C A ; if, then, we call C B = b, and C A = a, there will be equilibrium when P $\times$ a = Q $\times$ b, or P = Q b a. This is theoretical ; in practice other points must be taken into consideration, especially the friction of the bearing. Thus, if D equal pressure on bearing, f coefficient of friction, and r equal radius of bearing, we should have P a = Q b + f D r. Several mechanicians have had series of actual experiments made to test in practice the work which can be done—Coulomb, Morin, Walker, etc.—and these, although they vary among themselves, come near enough to give us a tolerably correct notion. Taking the results of the experiments of Walker, he finds that a man will work with a pressure of 12 to 14 lb. on the hook handle of a windlass at a velocity of 220 feet per minute, which will give us, taking the lower estimate of 12 lb., 2,640 foot-pounds. If, then, we take a case which we find frequently occurring in the West Riding of Yorkshire, or in Shropshire, where shallow coal pits are worked by a small party of men, and where you find one or two men at work on the windlass, we take Walker's estimate, and want to know what two men will be able to raise in a day of eight hours from a pit 155 feet deep, then we shall get 7 tons 10 cwt. 3 qrs. 12 lb. From various delays, from the occasional fall of the kibble, etc., it is not often that you can expect to get from the men the amount of work indicated by these rules. The barrel of the windlass is supported by two uprights, in each of which is cut a slot for receiving the axle ; there is usually no special seat, except a small piece of rounded iron placed in the slot ; the frame is frequently strengthened by a plank at the top, or by a bar. The whole apparatus is mounted on a couple of longitudinal pieces, and these again crossed by transverse bars, supported by little struts. It is an important point in these windlasses to have them constructed so as readily to be taken to pieces, and conveyed to any other part of the works where they are needed. Another point to be noticed is that there should be a simple catch to prevent the handle flying back, a hook or bolt by which the handle can be held.



In the streets of London, in connection with the sewers' works, some years ago might be seen a variety of windlasses, some from the central districts of England, of very simple construction, where, instead of uprights, the barrel was supported in the angle of two crossed pieces of wood. Another variety of windlass is that

with toothed wheels, where the men work on a pinion with six to twelve teeth, working on a larger wheel, and generally in connection with a drum of greater diameter than usual. With these larger quantities can be raised at a time, or from greater depths, and they may be seen in use in West Yorkshire, where the men, although winding away gently, raise a fair quantity in a given time. In the brown coal districts on the Continent, windlasses on a larger scale than those mentioned above may be met with, where, instead of a handle, they have a barrel of 2 to 2½ feet diameter, and handles, as it were, embracing the barrel, so as to be worked like the handles of a steering wheel. Spain is, of all countries of Europe, the country of windlasses, partly from the fact that a great number of their mines are opened in districts where there is a great dearth of water. Men are employed to wind from depths of 50 to 100 yards, and even more. They use a barrel of extra thickness, as much as 3 feet diameter, and very frequently ropes made of Esparto grass, and the men get through a wonderful amount of work, even with the heavy material they have to lift, coming quite up to, and even passing beyond, the amount you would expect from the calculation. In the French method, instead of handles they use a large wheel, several feet in diameter, with steps up which the men walk, and, according to Gen. Morin, the amount of work got through with these tread-wheels is somewhat greater than with the ordinary windlass, being as much as 3,176 foot-pounds per minute.

When we pass from manual labor to the use of horse power for raising the material, we are obliged at once to depart from the great convenience we had with the windlass in having the axle placed over the shaft. Where a horse is employed in the simplest way, we require to have a pulley over the shaft. The pulley may be of cast-iron, 2 feet diameter, placed on pieces of timber; these may be spread out a little, so as to leave the shaft clear between the four legs. The rope to which the kibble is attached passes over the pulley, and at the other end is attached to the horse, which walks along a horse-road, and same distance as the depth of the shaft; then it is made to walk back again, to allow the kibble to descend. This apparatus is attended with tolerably satisfactory results, till when the shafts become deep, and the weight considerable, there is a risk of the horse being over-run, or drawn back. The apparatus is known as the derrick, or the whipsey-derry. The horse whim is another machine, on the principle of the wheel and axle, and in it we require pulleys for guiding the rope from the machine over the top of the shaft. There is a framework by which the apparatus is supported, consisting of a long span-beam, generally 30 to 40 feet long, supported at the extremities on legs, and strengthened towards the center with diagonal struts, with additional struts at the sides to prevent it being turned over. A vertical strong beam supports the drum or cage, the latter being formed of three circles or rims, built together in segments, the sides completed by laths, as is commonly the case for chains, and sometimes for ropes, but with ropes the laths are generally placed close together. The drum should be consistent with the length of leverage required, 8, 10, or 12 feet diameter, or even more; attached to it is the horse beam, 26 to 36 feet long, to which one or two horses are attached as required, by means of an iron rod generally. Where chains or round ropes are employed, they wrap around the drum, and to prevent the rope passing down interfering with that which is passing up, there will be a brattice. Horse whims may vary much from this type, when they have to be employed for deep mines, in such countries as Mexico, or the Schemnitz District, or wherever there is a deficiency of water and fuel. Sometimes very large horse whims are employed; they are then large pieces of carpentry, wanting, perhaps, a large house to put them in, and having as many as six horse beams intersecting each other. Among the models you will see another variation, which differs in having a very small kind of drum, and which is used with a flat rope, for the double purpose of going more regularly down the shaft over flat pulleys, and also by its winding on itself alternately to increase and decrease the leverage as it winds. In old districts, in many places you may see a kind of frame for placing the pulleys on over the shaft, something like a window frame. At the present time, that has been almost entirely replaced by the system of poppet heads (that being the name given to them in the metalliferous districts, equivalent to the head frame, or shaft frame, of other districts), signifying a timber or iron frame, on which the pulleys are placed. The pulleys are placed not more than 8, 10, or 12 feet above the ground, for the purpose of allowing the rope to pass off horizontally to the drum: where other classes of power are employed, the frame becomes a very extensive piece of apparatus. The most convenient form for the poppet heads for a horse whim is to have a couple of legs with cross pieces, the pulleys resting on two other cross pieces, in such direction that a tangent struck from the surface of the arms of the drum shall just take the pulley in the right direction to pass down the shaft. In many districts cast-iron pulleys of 2 to 3 feet diameter are used, as in old times, but owing to the requirements of strength, of depth of rope, then the employment of wire-rope, and after that the introduction of machinery, giving greater speed to the apparatus, so these pulleys have been changed step by step. As these conditions changed it was found that the larger pulleys for use with the thick stiff ropes were too heavy. When a great velocity was given to the pulleys, on the weight being brought to the bank and landed, it was found that the pulleys, from the impetus they had, continued to run on for a considerable time, and this led to great wear and tear of the ropes. This caused the introduction, some twenty years ago, into the North of England, of compound pulleys, made up of a central boss of cast-iron, into which the axle is inserted, the rim of cast-iron, or in some cases of wrought, usually cast with sockets in it for the reception of the arms, which are mere slight round bars of wrought iron, and in this manner the weight of the entire apparatus was most materially diminished. In the larger collieries these pulleys may occasionally be seen 20 feet diameter, very commonly 12 feet to 16 feet. In one case which the lecturer had recently seen, the pulley was 21 feet 6 inches diameter, and wrought-iron arms 1¾ inches diameter, and the weight of the whole wheel 4¼ tons.

A main point to be looked to where considerable velocity is to be attained is that the pulleys shall be placed a considerable height above the ground. For when we look at the large size of the drums which lift the weight in the shaft, as much as 60 feet in one revolution, the mistake of allowing the drum to make a single turn too many would dash the carriage against the top. In some cases they are 20 feet, in others as much as 60 feet above the landing stage. The frame for the pulleys will consist of standards of as much frequently as 12 inches square, laid on transverse pieces, or on a solid base of stone, which bears sockets of cast-iron for the uprights. Sometimes the uprights will be of four standards, with or without back legs; or the framing may have a triangular form, which appears to be the simplest and most satisfactory. The pulleys will rest at the junction of the uprights and back legs. The legs may extend back as much as 30 feet to 60 feet, and will be abutted against a strong wall, or against the engine house. Struts and stays of various kinds will be required in different parts of the framing; and to the frames will usually be attached the guides or conductors for guiding the cages in the shaft. Means must be added to enable a man to get up and grease the pulleys, either by steps or by a horizontal staging from the engine house, if it is close to.—*London Mining Journal.*

NOTE UPON THE COST OF TWO BLAST FURNACES IN THE CLEVELAND DISTRICT, IN ENGLAND.*

By P. Barnes, New York.

In vol. 33 of the Proceedings of the Institution of Civil Engineers, London (part 2, for 1870-71), may be found a statement of the cost of two large blast furnaces, together with a somewhat detailed description.

The attempt will be made in this note to restate these items of cost, so that the information may be rendered perhaps more accessible to our members than in its present place of record, and also in order that the items may be more intelligibly compared among themselves, or with similar items in other cases.

The leading dimensions, etc., of these furnaces are as follows:

Diameter of bosh	13 feet
" hearth	8 "
" bell	13 "
Height to platform	85 "
Capacity	30,085 cubic feet.
Product per week	500 tons.
Average consumption of coke per ton	20·35 cwt.

COST OF FURNACE PLANT.

Each item is given in a fraction of the total cost.

2 furnace stacks	·18672	Hotblast main	·02128
Furnace gallery	·01523	Gas down comer and flues	·03660
" hoist	·01727	Chimney	·00886
Hoist engine and house	·01921	Force pump and all pipes	·03534
Kiln gantry	·04175	Floor plates and paving	·01031
Kiln drop, for empty cars	·01409	2 locomotives	·03107
Bunkers	·03348	18 metal buggies	·00926
Kiln lift, for loaded cars	·03668	30 slag buggies	·01301
5 calcining kilns	·07683	20 charging buggies	·00160
18 hot blast stoves	·11079	1 scale	·00053
8 boilers with fittings	·09110	1½ miles railway	·05390
2 pair blowing engines	·08397		
Engine-house and tank	·04383	Unit footing	1·00000
Cold blast main	·01029		

Total cost of two furnaces and fixtures in money £56,331

COST OF FURNACE STACKS.

Concrete foundation	·0044	Boiler maker's labor	·0612
Red brick foundation	·0496	Bell and hopper	·0551
" pig bed	·0181	12 stack columns	·0496
Fire brick foundation	·0217	Belly pipe	·0102
Fire blocks for hearth	·1207	Slag boxes	·0418
" " lining	·1004	Water boshes	·0021
Stone curb	·0241	Sundry castings	·0583
Lime, etc., pig bed	·0026	Pipes and fittings	·0068
" furnace foundation	·0101	Coping plates to pig bed	·0051
Fire clay	·0118	Stores and tools	·0118
Coal used in building	·0066	Wages	·0376
Brick work in pig bed	·0072		
" furnace	·1270	Unit footing	1·0000
Wrought iron shell and rivets	·1561		

Total cost in money of 2 furnace stacks £10,517

COST OF CALCINING KILNS.

Excavating	·0057	Cone at base	·0577
Slag wall	·0462	Wrought iron shell	·2032
Red brick	·0600	Boiler maker's work	·0808
Fire blocks	·1131	Stores and tools	·0092
Fire clay	·0057	Wages	·0300
Lime and sand	·0404		
Brick work	·0554	Unit footing	1·0000
Castings	·2926		

Total cost in money of 5 calcining kilns £4,326

COST OF BOILERS.

Excavation	·0066	Safety valves	·0148
Slag wall	·0128	Sludge valves	·0062
Red brick	·0356	Lagging, cement, etc.	·0196
Fire brick	·1406	Sundry castings	·0931
Lime and sand	·0148	Stores and tools	·0403
Fire clay	·0107	Wages	·1284
Brick work	·0639		
8 boilers	·3620	Unit footing	1·0000
Mountings	·0506		

Total cost in money of 8 boilers £5,132

COST OF HOT BLAST STOVES.

Excavating	·0025	Valves	·0040
Concrete, etc	·0109	Valves, 36 in. x 12 in	·0317
Red brick	·0990	Valves, 18 in. x 18 in	·0230
Fire brick	·0719	Wrought iron chimneys	·0145
Lime, etc	·0262	Wrought iron ladders	·0009
Fire clay	·0054	Sundry castings	·0456
Stone work	·0011	Stores and tools	·0198
Brick work	·0862	Wages	·0633
Iron borings	·0032		
Stove pipes, 628 tons	·4667	Unit footing	1·000
Stove pipes, erecting	·0241		

Total cost in money of 18 stoves £6,241

COST OF CHIMNEY.

Excavation	·0160	Lime and sand	·1162
Concrete	·0200	Brick work	·3006
Red brick	·5272		
Fire brick	·0200		1·0000

Cost in money £499

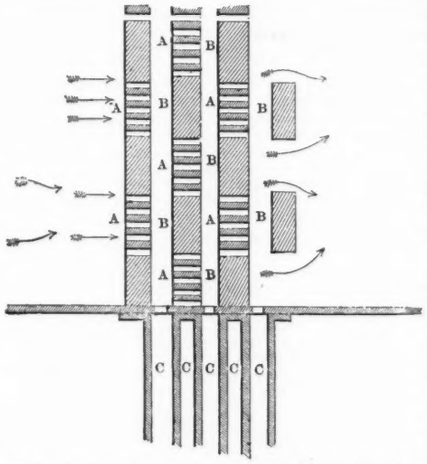
NO COAL BELOW LONDON.—The *Athenæum* says: The boring experiment made by the Diamond Boring Company at the brewery of Messrs. Meux, in Tottenham Court-road, has resulted in disappointment, so far as the supply of water goes, but it has settled a most important geological problem. Somewhat suddenly the borer has passed from the Lower Greensend into a stratum, well marked by fossils, which Mr. R. Etheridge, the palæontologist to the Geological Survey, has pronounced to belong to the Devonian rocks. The whole of the secondary rocks below the Cretaceous system is missing. No traces of the coal measures, or of the carboniferous limestone below them, are found. Old red sandstones, upon which the Tertiary formations have been deposited, form the base of the deposits in the valley of the Thames. This settles forever the question of the existence of coal near London.

* A paper read before the American Institute of Mining Engineers, at the Wilkes-Barre meeting, May, 1877.

MECHANICAL SEPARATION OF MATTERS IN SUSPENSION IN GAS OR VAPORS.

By F. Le Blanc.

The construction of the apparatus at present usually employed for the separation of matters held in suspension in coal gas, is founded upon the principle of condensation, by reduction of temperature, of those matters, and of the gas supporting them, by contact with large surfaces cooled by water, or by contact with the water itself. Condensation by compression has received but little attention. MM. Pelouze and Audouin, having noticed how tenaciously liquids in the globular or vesicular state are retained by gas, even during transport, have sought to arrest these vesicles by causing them to strike against solid surfaces, after passing under a pressure of about 2·2 inches of water through a finely perforated metallic plate. The liquid globules held in suspension by the gas, being arrested by their passage through the small holes, break against the surface of the second plate, dissolve, and, acquiring sufficient weight to cease to remain in suspension, trickle down the surface of the plate into a suitable reservoir. It has been found by experience that gas on its way from ordinary scrubbers, etc., to the purifiers, quickly blackens pieces of white paper held over an escaping jet, but that when the same gas has previously passed through the condenser constructed on this system no such blackening takes place, the tar, etc., being completely removed, so that the work to be done by the purifiers is greatly lessened. The quantity of purifying material required is much reduced, and labor is saved by the less frequent necessity for removal and renewal. The condenser, which is fully illustrated, consists mainly of an outer casing with a gas inlet at the lower part, and an outlet at the upper. Suspended within the casing is an annular water tank, in which is balanced a miniature gas-holder, or bell formed with four circumference plates, two of which are perforated, in rows, with small holes, and two with large holes; the latter being opposite the blank spaces between the rows of the former. The gas from the inlet, passes through the central space within the annular tank, and through the four perforated plates of the bell; the tar, etc., which condenses on the non-perforated portions of the surface trickles down the plates into the water tank. The bell, being balanced in the water to suit a normal pressure of gas, rises and falls with an increase or decrease of pressure, so that a larger or smaller number of perforations is open to the passage of gas. The condenser thus acts also as a regulator. It has been found that if the perforated bell has a capacity of 35·317 cubic feet, it will suffice for works producing 3,531,700 cubic feet per twenty-four hours or in the proportion of 1 to 100,000.



At the gasworks in Paris, producing the above quantity of gas, the condenser retained 19 6 lb. of tar and about 1·9 pint of rich ammoniacal liquor per 35,300 cubic feet of gas. At a small works, with the condenser passing the same quantity of gas, 158 lb. of tar and 28 pints of liquor containing 693 grains of ammonia per pint were obtained. The diagram here appended indicates the principle of action of the condenser. The moving gas meets the first plate, and passes through its perforations, A, from whence it is directed against the plain parts, B, of the second plate, and passing on thence through its perforations, A, it meets the plain parts, B, of the third plate, through which it afterwards passes to the main; each impingement against the plain parts being attended by the retention, on these parts, of the liquefiable matters in the gas, which afterwards trickle down the plates into the outlets, C C.—*Bulletin de la Societe d'Encouragement*, series iii. vol. iii. p. 465.

THE MINERAL RESOURCES OF UTAH.

By C. F. Allen, M. E.

(*Continued from page 29.*)

TINTIC DISTRICT.

About eighty miles to the south is the Tintic District. This, like most others, has suffered from mismanagement, and is but now recovering from the effects of such. The "Utah Southern," now completed for almost a hundred miles to the south, runs within forty miles of the mines, and proposes to push a branch in that direction. From this region comes a great deal of the iron ore used at the smelters, considerable copper ore, and some extraordinarily rich gold and silver ores. In 1871 was discovered the great vein of the "Mammoth Copperopolis," which has since turned out such a quantity and variety of ore.

This appears to be the northern vein, and runs north and south in the limestone, varying in width from ten to twenty feet, and at times widening even to sixty. The average value is said to be $30 per ton, while portions yield fabulous amounts. The "Mammoth Copperopolis" mine was worked by an English company, who took out a large amount of ore, but sadly gouged it. It averages from $30 to $40 per ton, and certain stacks of chloride are much higher. Considerable quantities of copper ore—blue and green carbonate, and red and black oxides—yielding from 10 to 35 per cent. copper and 20 to 50 oz. silver, have been taken out. Owing to the sorry condition of the mine the yield of late has been but thirty to forty tons per month.

And here it might be remarked that the numerous English companies who have operated in the Territory seem often to have been signally unfortunate in their modes of operations and in the selection of their representatives, for whose mismanagement both they themselves and the miners have too often suffered. To the north of the Copperopolis on the same vein lies the "Crismon Mammoth," the most valuable mine in the district. They have several veins in certain parts nearly sixty feet wide, and have taken out much valuable ore. An important strike was made of a ten-foot vein of gold quartz which yielded enormously. The workings are quite extensive, to a depth of 450 feet, and are very unsystematic. The silver ore, a free milling chloride, will average from $40 to $100 per ton, with selected portions $1,000 and upwards; the copper ore yields as high as 46 per cent. metal; and the gold ore will average $250 per ton. Certain portions assay from $25,000 to $100,000 per ton. At present the mine is working from twenty to thirty men, and shipping thirteen tons daily of gold and silver ore, averaging respectively $250 and $75 per ton. The former is worked at their own five-stamp mill, seven miles distant, and the latter at other mills in the neighborhood. In addition to the great vein mentioned, which carries such an amount and variety of ore, and on which are other locations, are a number of smaller ones, from a few inches to several feet in thickness; some carrying gold ore, others chloride of silver or bismuth silver, while still others produce sulphurets and a good smelting lead ore. These ores vary in value from $40 to $200 per ton. The smelting ores are shipped north; the others treated on the ground. For this purpose are several mills: the Crismon, Wyoming, and the Shoebridge. The latter has lately adopted a modification of the Hunt, Douglas & Stewart process. Of the other mines of importance are the "Tesora," shipping $40 to $50 bismuth silver ore; "Golden Treasure," $250 bismuth ore; "Wild Rose," copper, silver, and bismuth ores; "Silver Spar," argentiferous carbonate of lead; the Black Dragon, Bowers, Julian Lane, Sunbeam, and others. I am not aware of attempts being made to extract and save the bismuth. In addition to these are the iron mines, which yield large amounts of a good hematite ore, containing 50 per cent. iron, considerable manganese, and several ounces in silver. This is laid down at the smelters for about seven and a half dollars a ton. Of those producing are the "Black Stallion," 30 tons; the "Iron Queen," 10 tons; the Merrimac, Blackbird, and others. The shipment for May was 680 tons.

Besides the smelting ore, Tintic shipped during April $45,000 in silver and $10,000 in gold bullion; during May $16,000 in silver and $32,000 in gold, the latter being the product of the Crismon Mammoth.

AMERICAN FORK DISTRICT.

Some thirty to forty miles to the southeast of this city lies the American Fork District. A narrow gauge railroad leads from the "Utah Southern" about twenty miles up the cañon towards the mines. This was built to bring down the ore from them, but is now used chiefly to carry tourists through the cañon, which boasts of some of the finest and most picturesque scenery in the West. The "Miller," the leading mine, has produced a great deal of very fine ore, which was formerly smelted at the old Sultana Works in the cañon. The ore, being a ferruginous carbonate mixed with galena of over 50 per cent. lead and 30 to 40 oz. in silver, was well adapted to the purpose. The deposit was a large one, lying in the limestone near the contact with quartzite and running with the stratification.

The mine is said to have been badly gouged, and at present is employing but a small force and taking out but little ore. Some fine specimens of wulfenite, molybdate of lead, have been found here. The "Pittsburg" and "War Eagle," owned by Pennsylvania parties, lie close by, between the lime and the quartzite. They are reported to have a fine seam of ore similar to that of the "Miller," running about 50 per cent. lead and 18 oz. in silver. It is estimated that there are nearly 15,000 tons of this ore in sight, and upon which work is to be resumed.

PARLEY'S PARK DISTRICT.

Parley's Park District, embracing the Uintah and Blue Ledge, is situated thirty miles to the east of Salt Lake City. With it is associated the name of the Ontario Mine, the pride of the Territory and the mainstay of the camp. This great mine was discovered five years ago, since which time a great deal of money has been expended upon the property, and a still larger amount realized from it. Now it ranks as the first in the Territory, and the regular heavy shipments of bullion daily increase the confidence felt in it. A hundred feet to the north of the vein—to which direction it dips at a slight angle—was sunk the main shaft, from which, every one hundred feet, drifts are run south to the vein, where levels are driven as usual, and at every fifty feet chutes put in. At the present depth of 400 feet, the shaft is close to the vein, and will soon cross it. A fine engine runs a cage, on which are hoisted the cars from the different levels, while a large 15-inch Knowles pump serves to keep the mine free from water, an element which has been the cause of considerable trouble from time to time.

From the soft condition of the vein, considerable timbering becomes necessary, and in this respect, as indeed in the whole management, much care has been expended. Developments are being rapidly made, and several years' supply ahead is kept in sight. The vein lies between the so-called porphyry and lime, and varies from two to ten feet in thickness. The ore contains native silver, chloride and sulphide, with silicious (?) gangue. In and about the mine, a hundred or more men are employed, who extract daily a hundred tons of $100 ore. In connection with the mine, and run by a 250 horse power engine, is a fine 40-stamp mill, capable of treating 65 tons a day. The fine milling ore is worked raw, while such portions as contain too much sulphur are first roasted and chloridized. For this purpose a large Stetefeldt furnace of 30 tons capacity (?) is used, which seems to give general satisfaction. The milling facilities are to be at once increased, and the yield of bullion, already $140,000 per month, in proportion. The following, clipped from the Salt Lake *Tribune*, speaks for itself:

"The Ontario Mine, which is now being dealt in at the Board, was admitted to the stock list by the Governing Committee of the New York Stock Exchange upon the following statement:

"The property is situated in Uintah Mining District, Summit County, U. T. A forty-stamp mill was completed for a thorough reduction of the ores February 1, 1877, at a cost of $230,000. There has been expended in the development of the mine, and for construction account and all other purposes, $628,413.15 in currency. Production previous to January 1, 1877, gold value, $906,459.57; ore sold for currency, $42,116.05; present capacity of mine, 100 tons per day; present capacity of mill, 80 tons per day; lowest estimate of ore now in sight, 30,000 tons, valued at $100 per ton. The company has no bonded debt; capital, 100,000 shares of $100 each; no debts, liens, or incumbrances of any kind or nature. Gross yield from February 1, 1877, to March 1, 1877, $120,000; gross yield from March 1, 1877, to April 1, 1877, $140,000; gross yield from April 1, 1877, to May 1, 1877, $139,550.71. Transfer office at Wells, Fargo & Co.'s, 66 Broadway. Stock registered at Union Trust Company. New York office of company, 34 Broad Street. Officers: President and Treasurer, J. B. Haggin; Vice-President, R. P. Lounsberry; Secretary, B. B. Minor. Dividends of 50 cents, in gold, per share, have been declared and paid for February, March, and April of this year, leaving a surplus on hand in gold of $100,000."

In addition to the Ontario are the Flagstaff, McHenry, Hawkeye, and Pinion, which promise to become of importance. The Marsac, owning the Flagstaff, and the McHenry companies, each have mills of their own which they are now proposing to start up again. The tailings from the mills are being concentrated, and with apparent success. With a few slight exceptions scarcely anything in the concentrating line is being done, and in no branch of mining engineering is there a better field offered in any of the camps.

STOCKTON DISTRICT.

Stockton is situated about forty miles to the west and south of this city. Like many another camp it has seen better days, although even now it is looking far from bad. The mine lies to the east of the town on the slopes of the Oquirrh Range, rather low down and easily accessible. A narrow gauge railway runs west from here about twenty miles, and is soon to be completed to within a few miles of the town. This will cause a saving of several dollars per ton in freight, and will prove a help to all the districts to the west. The mines are of two kinds: those carrying considerable iron, making excellent fluxing ores, and those containing less of this metal, but much more of lead.

The former seem to lie lower down between the quartzite and lime, with a general direction of northeast and southwest, and the latter above in the so-called magnesian limestone, running east and west. As a whole, the ores run low in silver, from 15 to 75 oz., but very well in lead, particularly those which come from the upper limestones, where the ore is more of a galena and not so much of a carbonate.

The veins vary from one to several feet in thickness, and carry more or less silica and some lime as gangue. At times they widen out into pockets, and at others pinch out almost altogether. This pinching out, which comes in several hundred feet below the surface, has proved a serious drawback to the camp, as few have the courage or capital to sink far in barren ground in search of more ore. In one or two cases where it has been done success has crowned the effort. Of the mines the "Silver King" is perhaps the most extensive. This is down six hundred feet, and is producing 20 tons of ore per day, yielding $15 in silver, 16 to 18 per cent. Pb, and considerable iron. It is owned by the Chicago Company, which pushed the workings through barren rock and met with good ore below the break.

The other mines are down from 50 to 350 feet in depth, and show veins from one to four feet in width of galena ore, yielding richly in lead, but poorly in silver.

Among these may be mentioned the Great Basin, Glove, Reno, Kathlena, Argent, and others. The smaller mines are not very systematically worked and vary in their output. Good concentrating works would enable many mines now idle to be profitably worked.

OPHIR DISTRICT.

Ophir, a few years ago the liveliest camp in the Territory, and now one of the quietest, lies twelve miles further on in Ophir Cañon. In its palmy days it produced a large amount of very rich ore, but many of the mines seemed to be merely pockets, which were soon worked out, and then, without much further prospecting, abandoned.

The neighboring mountains are full of small holes, from each of which have been taken a few tons of very rich ore. On the larger bodies of less rich material more work was done, and from them more or less ore is shipped daily. Attracted by the rich ore hundreds of people sought the place, and numerous mills and furnaces were erected for its treatment, but it was soon found that the supply was not equal to the facilities for treatment, and as that supply decreased one by one the mills were shut down, until now all are abandoned.

Of these works the Pioneer Mill was by far the most complete. It contained ten stamps, with the accompanying pans and settlers, a fine engine, building, and Aiken furnace, and treated, in its day, plenty of very rich ore, both raw and roasted. The ores of the camp vary considerably in quality. The richer carry considerable chloride and sulphide of silver; others copper, oxidized from the sulphuret to the blue and green carbonate; yet others are mostly rich galenas, while a fourth class consists of a very decomposed material, carrying considerable iron oxide and lead carbonate. Of this last and rather peculiar looking ore is the Miner's Delight. It belongs to the Chicago Company, who are taking out about twelve tons daily of ore yielding 20 per cent. Pb, 25 oz. of silver, and considerable iron. Ophir Cañon appears to have cut its way through the mountains, just about at the axis of a great anticlinal. The stratification of the limestone—certain layers of which abound in silurian (?) fossils—is plainly seen as one approaches the town, where they rise up in vertical cliffs on either side. The ore bodies, or many of them, lie between and nearly conformable with these strata of limestone. They are sometimes struck by following in a small stringer vein or by the outcrop on the surface. From their peculiar bedded character, they have frequently been very poorly worked, and too often on the gouge principle. No doubt to this reason may be ascribed many of the failures which served to bring disrepute upon the camp.

Geologically speaking, it is a very interesting place, and has been the scene of several scientific explorations. The Miner's Delight, already mentioned, the Monarch, Zela, Panamint, and others, whose veins vary from one to several feet in width, are all being worked.

DRY CANON DISTRICT.

Just over the mountain, on one side of the anticlinal, lies Dry Cañon, famous for some very rich ore it has produced. The mines are situated very high, several thousand feet above the plain, in the limestone strata, as between the leaves of a book. A good road leads to the smelters in the valley.

This is by far the liveliest camp of the section, and boasts of several very good mines which are putting out a good amount of ore daily. Five or six of these are down from four to nine hundred feet, and work from 20 to 100 men each. The larger part of the ores may be called galena, but some kinds have been found which yielded enormously, and were called tellurides of gold and silver.

Certainly, some small lots of ore were found which assayed $20,000 to $40,000 per ton, and were pronounced such. Small fortunes have been taken from pockets of such ore. Other ores yielding silver glance have proved very rich. The principal mine is the Hidden Treasure, owned by the Watterman Company, and opened to a depth of 900 feet. They have a fine showing of galena ore, and with their hundred men ship 20 tons daily, giving 60 per cent. Pb and 24 oz. of Ag. At the same time much dead work is done, and the mine is being put in fine condition.

The Queen of the Hills, owned by the Chicago Company, employs 25 men, and ships 25 tons of ore per day (25 per cent. Pb and 80 oz. of Ag). The Herschel, lying next the Queen, produces similar ore. The Mono and Kearsarge are the two mines that have turned out the richest ore. From one small pocket $36,000 was taken in a few days. Both appear to have been faulted, and to have lost the pay ore, but which, on sinking further, was recovered. Of the other mines the Alps and Deseret are the most important. The output of the smaller mines is not so regular as those of the large and low grade ores. Litigation, the plague of a mining community, has also stepped in to impede the progress of some of the best pieces of property.

Grantsville is a small and unimportant district near Stockton, where several good strikes of galena ore have recently been reported. As yet its yield to the smelters is of little moment. These four Western districts sent most of their products to the Chicago and Watterman companies at Rush Lake to be smelted. The output from the two smelters, of two stamps each, for May was 380 tons of base bullion. (One of these has since been burned.)

LEEDS DISTRICT.

This remote and most curious mining district has been spoken of and described in a previous article.* Scarcely a year old, it promises to become one of the leading districts of the Territory, and, if the hopes of those interested are fulfilled, a rival of the Comstock. The sandstone beds, so far as developed, have produced well, and equaled the expectations of their best wishers. For a long time mining men scarcely seemed to understand the situation, and from the variety of reports became puzzled and seemed to lose faith in the country; but the steady output of the mines and the regular shipments of bullion finally convinced the most skeptical that mines there must be, and that of value too.

As previously described, these are workings in such beds of sandstone, varying from a few inches to six feet in thickness, as contain enough of silver to pay for mining. The ore—a chloride of silver interlaminated with the sandstone, together with some carbon, iron oxide, and copper—is easily crushed and cheaply milled. The Leeds Company during the last four months have crushed and worked in their ten-stamp mill over 3,500 tons ore from their mine. Theirs is the most extensively opened one in the district, and is producing 30 tons of 50 or 60 dollar ore a day. The milling facilities, consisting of two other small amalgamating and one leaching mill, are to be further increased by the addition of two more, one of ten and one of five stamps, which will supply a much needed want. The Barbee & Walker reports over 200 tons of $70 ore on the dump, a depth of 200 feet, and a good showing; the Emily Jane, several feet, $150 ore; the Stormout, a six-foot bed of ore in the shaft, averaging $150 per ton; the Duffin, a shipment of 20 tons of ore netting $5,000 and plenty more in sight; and a dozen others nearly as well. When one considers that scarcely four of these are down a hundred feet, or consist of more than a single shaft, the showing must be granted a good one.

Of the other mines, the Vanderbilt, Maggie, Morning Star, and others, and of the proposed operations of companies formed, lack of space forbids further mention. The district, which from its peculiar character is attracting considerable attention and is somewhat closely watched, promises to prove a good one, and to open up a new kind of mining for this country.

SAN FRANCISCO DISTRICT.

Forty miles to the west of Beaver City, and to the southwest of the center of the Territory, in a country considerably broken up by volcanic disturbances, is San Francisco District, where is situated one mine well worthy of notice. This is called the Horn Silver or Bonanza, and is generally conceded to be the largest known deposit of ore in the Territory, and, one might perhaps say, in the West. From its situation, it is supposed to be a contact vein between the lime and the porphyry, although the developments made have failed to reach the wall to determine the matter. The shaft, 240 feet deep, and three sets of levels, driven at right angles from 20 to 150 feet each, *are all in ore*, which even cropped out on the surface, so that many tons had to be removed to make room for a horse whim.

Everywhere, above and below, in the levels, drifts, and shafts, is ore, and still further developments, steadily made, but serve to prove the deposit still larger. It is estimated that there are at least 400,000 tons of ore in sight, variously valued at from $5,000,000 to $15,000,000. Surely such a showing is remarkable, and few who have not seen it can realize it. The four owners are quietly developing the property, and at the same time, with a few men, are turning out enough ore to run several smelters. The ore is itself a curious mixture of sulphide, sulphate, and carbonate of lead, containing considerable free sulphur, and more or less iron, arsenic, antimony, baryta, and lime. In different portions of the mine it varies somewhat, but averages 40-odd per cent. of lead, and 20 or more ounces in silver. In certain places it contains much baryta, which carries enough silver glance for a milling ore, and in others enough iron oxide to considerably enhance its smelting powers. It is easily mined, without blasting, and without sorting, as no rock occurs in it. When more fully opened it will probably be worked from the top as an open quarry. Its size and position will amply warrant it. In addition to the three smelters of the county—mostly supplied from this mine—a fourth and larger one is being erected to smelt the ore.

It requires previous roasting, which is done cheaply, though perhaps not very efficiently, in open heaps. One or two other mines lying near by also aspire to bonanzas. Within a short distance a fine body of hematite ore, yielding 50 per cent. iron, is found. It is used at the furnaces for flux, together with such other ores as come from the neighboring camps.

Some little distance to the east, near Minersville, are a number of mines which are producing more or less ore. Near by is the Cliff Mine, which a few years ago was producing considerably. At present little is being done. At Milford they have a fine ten-stamp mill for treating the ore, but which has been but little used and has now been for a long time idle.

TO BE CONTINUED.

MINING NEWS.

Staff Correspondence of the Engineering and Mining Journal.

COLORADO.

Georgetown.—The Equator Mine, which has been idle for several years, is now once more at work. Hoisting works are building over the 400-foot shaft.

The Emma Mine, on Democrat, is still paying very finely, and yielding ore that mills from $700 to $1,000 per ton. The net yield of the mine during July was $3,000, taken out entirely by drifting, with four men.

The *Courier* has the following concerning the other mines of Democrat Mountain:

"During the past month but little work has been done on the Fred Rogers, on account of water in the deep workings. The lessee, James E. Johnson, has well employed the time in general repairs and in getting in wood, and is now ready to take out the water and resume mining. This will probably take ten days. There is good paying ore in three places between the third and fourth levels.

"Since the rich surface pockets taken out by McNulty, Majors, and Oaks, and others, two years ago, thousands of dollars have been taken from surface deposits, and it is said not one-half of the surface ground known to contain ore has been worked. A new lease has been let to Closs Johnson and others to resume work on these surface ore bodies.

* "The Silver Sandstones of Utah." See ENGINEERING AND MINING JOURNAL of May 12, 1877.

"On the Polar Star a difficulty has been encountered on account of the stack of the new engine. The stack is 400 feet in length, and over a hundred feet runs horizontally along a drift before entering the shaft through which it reaches the surface. They say the draft goes down the shaft, and on one occasion the workmen on the machinery came near being suffocated. A large fan blower is to be put in discharging into the horizontal pipe at an acute angle with it, which, it is hoped, will correct the difficulty.

"Messrs. Baron & Company, mining on the Lucky-Hesperus, have done very well of late. Four men have been working in breaking ore, assorting it, and hoisting it up one shaft, and moving to another through which it was hoisted to the surface. In the last two weeks in May they produced $466 worth of ore, the expenses paid amounting to $20. In the next two weeks they produced $654 worth of ore, the expenses for supplies and packing being $34. After paying 25 per cent. royalty they had $50 per week per man.

"Since then Mr. Baron bought out his partners, and has hired two men. During the last week the three took out $281 worth of ore, at a net profit to Mr. Baron of $160. These figures are given to show the results of a fairly successful lease."

The ore being taken from the Mendota shaft shows considerable improvement on past production. Assays run from 200 to 300 ounces. This mine has been idle for some years past until a short time since, under the supposition that it was too low grade to be profitably worked.

The Sunshine Company are having more ore than their 15-stamp mill at Idaho can treat. The mill is running finely, and saving a high percentage of the gold. The mine is in excellent shape. The company are preparing to do their own hauling in the future, and expect to be able to handle their ore from the time it leaves their mine till it becomes bullion, at a cost not to exceed $2 per ton.

Work is to be resumed shortly on the High Grade Tunnel.

The Crystal is being cleared of water, and will, in a few weeks, be under work.

The gulch miners on Spanish Bar and below are generally doing well. Bennett & Co. at Fall River have got to work again for the season, and hope to strike the main pay streaks this summer.

The Hukill is extracting ore steadily. The lower level, after passing through a barren streak, has again come into fine pay. The track of the Colorado Central Railroad is now laid directly across the dump of the mine, so that the item of ore hauling by quartz wagons is forever ended.

The Terrible Mine has again begun to produce ore after its long silence. This property will rapidly be put into first class order, and by the end of the year will no doubt be among the great mines of Colorado. The Union tunnel is going ahead under a force of nine men.

San Juan.—The La Plata *Miner* furnishes the following items from the Southwest:

"*The Wheel of Fortune Mine*, owned by Brookover, Wright & Co., has been worked by a force of eight men during the past winter, and the fact that Mt. Sneffels has the richest mines in San Juan, has been demonstrated by the development made on the Wheel of Fortune during the past eight months. Eighty tons of ore has been taken from the mine in making the developments of the past winter. The ore will average three hundred ounces, while the first-class ore runs over 1,000 ounces. A fair specimen of the mineral has been left at this office, which runs over 2,000 ounces in silver to the ton, and carries ruby silver in abundance. There is no denying the fact that the Wheel of Fortune justly merits the most flattering reports ever circulated of its richness. The developments already made represent about 500 feet of work, and consists in three levels on the vein. The lower level is in 180 feet, the middle one 150 feet, and the upper one 33 feet. The two upper levels are connected by a shaft 100 feet in depth. The ore has been sold to the lixiviation works of Van Gieson & Houghton at Lake City, and Messrs. Crowell & Greenlee are now engaged in packing it from the mine to the mineral farm in the vicinity of Ouray, from which point it will be taken by Messrs. Van Gieson & Houghton over the range to Lake City via Mineral City.

"The Monetizer is the first extension of the Wheel of Fortune, and is owned by Brookover, Wright & Co. The Silver Queen, owned by the same parties, crosses the Wheel of Fortune at right angles, and shows brittle silver and ruby.

"The Mark Twain and Grand Trunk lodes are also owned by Brookover, Wright & Co, and they have let a contract for a 70-foot cross cut tunnel to tap the vein of the Mark Twain, at its junction with the Grand Trunk, and also for a drift each way from the tunnel on the vein. Messrs. Coyne & Johnson have the contract and have already commenced work.

"Messrs. Quinn & Richardson have a large force at work upon their property. They have some rich mines. The Patosa is an extension of the Wheel of Fortune. The Highland Lassie and Chief Deposit both show ruby silver, and carry a large body of mineral.

"The 'Printer Boy,' now being worked by John Houghton & Tevis Brothers, is showing up splendidly.

"Messrs. Carran & Grant are at work on the Virginus, and have a large amount of ore on the dump. The mineral is galena and gray copper. They have a force of eight men employed.

"James McCarroll is at work upon his lode, and is taking out some splendid native silver. The mine shows up well, and gives promise of big pay.

"Messrs. Wright & Quinn met Dad Town and Mike and James Dormady and Mr. Bush on the road to Sneffels to resume work upon their property, which includes the Yankee Boy, the Dutch Boy, and other lodes, among the best in the district.

"*The Aspen Mine.*—Messrs. Thomas Blair and William Kerns have taken a lease upon the Aspen. The lease calls for a shaft 250 feet deep, and a drift 150 feet east of the shaft, at a depth of 200 feet, and also 100 feet west of the shaft upon the same level. This gives the parties leasing 250 feet of stoping ground from the 200-foot level up to the 100-foot level. The contractors are now taking out some as fine mineral as the mine has ever produced. A specimen has been left at the *Miner* office cabinet, which is a fair sample of the mineral now being taken out. This mine, which has for the past two years produced $50,000 worth of ore, promises to more than double the amount the present season.

"*Little Maud.*—This mine, which was discovered last season by Levi Trentham, is showing up richer and better every day. The owners are doing their second year's assessment, and are taking out some very rich gray copper and galena ore. The same parties have several locations in the same locality as the Little Maud, and they all show gray copper.

"*New Discovery.*—The Moyle brothers made a very rich discovery last week, which really is as fine looking mineral to come from a new discovery as we have seen in the camp. The vein is located just above the Silverton tunnel now being run by them, and has 14 inches of gray copper from the very top. The specimen shown us, taken out two feet from the surface, was solid gray copper, and would weigh ten pounds.

"*Eureka District.*—Birt Clifford has shown us some specimens of mineral, such as is now being taken from the Centennial lode in Eureka District, that is very rich. The ore is gray copper in iron pyrites and quartz. The pay-streak is 14 inches in width, and mills 491 ounces in silver to the ton. The mine is owned by Messrs. Clifford, Rothermel, and Harry LeRoy.

"The blast furnace of the Silverton Smelting Works was fired up this morning. Its starting this season is under the most favorable auspices. Over 250 tons of ore have already arrived at the works, 150 tons of which has been crushed and roasted, and is ready for the blast, and ore is arriving at the works at the rate of 15 tons per day, and no danger of any falling off of the ore supply."

NOTES.

ENGLISH penny pieces, as now coined, weigh 48 to the pound, so that a penny is just one-third of an ounce. Halfpence are 80 to the pound, measure exactly one inch in diameter, and laid on an ordnance map cover 500 acres apiece.

DISCOVERY OF A GOLD NUGGET IN NOVA SCOTIA.—A nugget of gold, for which five thousand dollars has been offered, was found in a new "diggings" at Moose River, east of Halifax, Nova Scotia. It is said to be the largest ever found in that province, and its discovery will refresh the fainting hopes of those who were in doubt whether gold mining in that district could be made to pay.

THE AMERICAN EMIGRANTS IN AUSTRALIA.—Messrs. R. W. Cameron & Co., the agents of the Australian government for sending emigrants from America to Australia, have received letters from Sydney, New South Wales, stating that all the passengers of the *Boynton* and *Nevada* had obtained employment within three days after landing. The *Annie H. Smith* has not yet arrived. No more passengers will be sent until fall.

IMPORTANT MINING CASE—HEAVY DAMAGES FOR FLOODING A MINE.—The coal mining case of Prevost *vs.* Gorrell, which has been pending several weeks in the United States Court at Pittsburg, was concluded last week. They are lessees of coal mines on different sides of the Centralia Basin, in Columbia County, and Prevost sued Gorrell for damages in flooding his mine. The jury found a verdict for Prevost, awarding $128,808.41 damages, the full amount claimed.

THE BROOKFIELD MINE DISASTER.—Mr. Andrew Roy, Inspector of Mines for the State of Ohio, has asked that the coroner's inquest in this case be reopened, that further evidence in the matter may be given and the blame placed where it properly belongs. Mr. Roy, although advice was sent him at Columbus, was unable to attend the inquest, owing to his absence. This case should receive thorough investigation that further accidents of a similar nature may not occur. It is said that another poorly ventilated mine in the State proposes to try the same experiment.

TO PREVENT STEEL FROM OXIDIZING DURING TEMPERING.—Small articles in steel are said to be preserved from rust by being tempered by giving them a coating of ferro-cyanide of potassium. For this, two parts of finely-powdered charcoal and one part of ferro-cyanide of potassium are boiled up to a thick paste with a solution of gelatine or strong glue. After warming them, the articles are dipped into this mass, dried, dipped again, and so on, until the coating is the twelfth of an inch thick. The articles can then be exposed to a coal fire, heated to redness, and tempered without fear of rusting.

NORTH CHICAGO ROLLING MILL COMPANY.—At the annual meeting of this company, held in Chicago on the 16th inst., the last year's Board of Directors was re-elected. The officers of the company for the ensuing year are: O. W. Potter, President; S. Clement, Treasurer; S. P. Burt, Secretary. The report for the year ending July 1, 1877, has the following items: Steel rails made, 38,205 tons; iron rails made, 18,995 tons; pig iron, 38,865 tons. The gross earnings were $3,342,094.64; the surplus July 1, 1877, $658,241.50. The stockholders decided to declare no dividend for the present, but to retain the surplus for working capital.

ANTHRACITE COAL DISCOVERY IN NEW BRUNSWICK.—A thirteen-foot seam of anthracite coal has been discovered at Mace's Bay, Charlotte County, New Brunswick, twenty-eight miles from St. John, the bed cropping out on the shore. It has been inspected by a New York mining engineer, and analyzed by Mr. Harrington, of the Canadian Geological Survey, who finds in it fifty-eight per cent. of fixed carbon, about five per cent. of volatile combustible matter, and thirty-seven per cent. of impurities. A company is being formed to work the property, to erect piers, etc., at an early date.—*Monetary Times* The "Blue Noses" will have a good time marketing this anthracite in competition with Pennsylvania.

CORRECTIVE IN LEAD-POISONING.—Workmen employed in the manufacture of white lead are always liable to lead poisoning, both by inhaling the dust and in touching the lead with the hands. Various correctives for this have been employed, and among these the latest and most simple is a careful washing of the hands in petroleum. Three washings a day are reported to be sufficient to prevent all serious danger of poisoning. The benzole in the petroleum is said to scour the skin and remove the dust of lead, and the fatty substance in the oil prevents the absorption of the lead salts. The experiments made with petroleum used in this manner give such good results that it is proposed to use the same material as a guard against poisoning in other industries where the salts of copper or mercury are employed.

A LUCKY GOLD MINER.—The richest strike made in this country for many years, and as rich perhaps as was ever made, we here have the pleasure of recording. A. O. Bell, commonly called "Pike" Bell, who, with his family, lived for many years on Bald Hill, a few miles north of Auburn, as many know, is a dauntless prospector. Though occasionally making a strike of some considerable importance in the past, he has managed, like most modern prospectors, to keep poor. About three weeks age, when hunting around over the hills, he struck his pick into a little mound which resembled somewhat in appearance an ant-hill, and to his delight he unearthed some pieces of decomposed quartz, attached to which were some colors of gold. Encouraged at this prospect, he began to sink his new lead, and was rewarded by finding more or less gold at every stage of descent. Last Saturday he had reached a depth of about thirty feet, and had taken out in sinking that far rock estimated to be worth about $1,500. The rock being extremely rotten, or what is called by quartz miners decomposed, he had with little effort pounded out in a mortar enough to pay expenses as he progressed. He had hired men to assist him in working the mine, and on last Monday morning they went to work as usual. The gouge, as we would call it, as it is too rotten to be properly called a ledge, was discovered by noon to have become suddenly richer. In the afternoon chunks of almost pure gold were taken out, and the decomposed stuff that filled the interstices between the rocks was so rich in gold that Pike began to wash it out with a pan. From three panfuls washed Monday afternoon he obtained gold estimated to be worth between $4,000 and $5,000. That evening he came into town, and, giving us a hint of what he had got, invited us to go and see it. On Tuesday afternoon, in company with Sheriff McCormic, we visited the mine. We found Bell with a pan of gold in his hands worth from $1,000 to $1,500, which he assured us all came from one pan of dirt. "But," said he, "if you don't believe it, I will wash another pan and show you." We told him to wash. The pan was sent down into the shaft and soon returned filled with a mass of muddy, rocky stuff that sparkled all over with pieces of gold. This was washed out and found to contain fully as much of the precious metal, if not more than the one he had just finished panning when we arrived. On Wednesday evening

Mr. Bell (it is "Mr." now—it was Pike before) informed us that he had taken out $10,000 in three pans that day; that he had taken out, all told, up to that time, between $30,000 and $35,000, and that he had an offer and was about to sell for $20,000. When asked his notion for selling, he said he would get away with about $50,000 and that was money enough for him.—*Placer (Cal.) Herald, June 24.*

THE COMSTOCK MINES.—We take the following from the *Gold Hill News.* The Consolidated Virginia Mine is yielding from 500 to 550 tons of ore per day. The ore stopes are looking splendidly on the 1,650, 1,550, 1,500, and 1,400-foot levels. The north drift from the Gould & Curry on the 1,750-foot level has penetrated the wall of the ledge and cut the ore vein, which at that point is quite solid and fair grade ore, although not so rich as that on the 1,650-foot level further to the northward. Much trouble is experienced in running this drift, on account of the great heat caused by a heavy influx of hot steam and vapor, created by the hot water now being drawn off in the Best & Belcher and Gould & Curry mines. The main south drift on the 1,550-foot level is being steadily enlarged, in order to create a better circulation of air. The east drift on this level cut, during the first part of the week, a fine streak of rich ore 12 feet in width. This ore is being prospected to the southward, and still appears to be as wide and rich as when first struck. Sinking the C. & C. shaft is going steadily ahead. The flow of water is still strong. The California output is from 550 to 600 tons of ore per day. The 1650-foot level is opening up rich in almost every quarter, and the double joint winze now being sunk near the south line of the mine is now down 42 feet, the entire distance having passed through rich ore. The northwest branch drift, on the 1650-foot level, has been finished to and connected with winze No. 4, which now affords a splendid basis for the stoping and extraction of ore from that portion of the mine whenever it is desirable to do so. The mills are all running and crushing ore up to their full capacities, and everything in and about the mine looks bright and prosperous for the future. Sinking the C. & C. shaft is making excellent progress, considering the hardness of the rock encountered at the bottom and the steady strong flow of water. The west drift from the C. & C. shaft, on the 1750-foot level, is advancing at the rate of from four to six feet per day, the face still in extremely hard blasting ground. On the 1750-foot level the north drift from the Gould & Curry has passed into the ore body. The ore is hard and solid and looks well. It assays from $20 to $59 per ton; the ore has been penetrated 9 feet, but the water of the vein has not been reached, therefore the main vein is not yet cut. The vein has been encountered farther east than expected. There is no change to report of the prospecting operations on the 1785-foot level of the Chollar Potosi Mine. Sinking the Combination shaft is going steadily ahead. It is now down 1468 feet. Daily yield, 85 tons of ore, the average assay value of which is $23 per ton. The north drift on the 1400-foot level of the Caledonia mine is being steadily advanced, the face in quartz heavily charged with pyrites of iron, which gives assays of $15 to $20 per ton of gold, the assays showing only a trace of silver. Sixty-five tons comprises the daily ore yield of the Belcher mine. The face of the east drift, at the 1900-foot level, continues in quartz and porphyry: it is now in a distance of 239 feet. The south drift, at the same level, is in forty-two feet, with its face in good looking quartz. At the 1600-foot level the east crosscut from the main south drift is in 223 feet, and still running in low grade ore. Sinking the main incline progresses well, although a considerable increase of water is met with. Daily yield of the Justice mine, 450 tons. The various ore producing sections are yielding and holding out finely. The drift east at the 1150-foot level is in birdseye porphyry, and driving ahead. An increase of the heavy flow of water is encountered. The header of the Sutro Tunnel continues in easy working ledge porphyry, with streaks of quartz and clay and regular Comstock formation. Very good progress is made in this material. The course of the tunnel is about 300 feet north of the Savage-Norcross-Chollar Combination shaft, and it has to go over 1200 feet in order to reach a point opposite. The miners in this shaft say that they can hear the blasts which are let off in the header of the tunnel, and the miners in the tunnel say they can hear the blasts let off in the Combination shaft. Whether this is so or not, the Sutro tunnel has certainly reached and cut into the regular Comstock ore belt, and before many months will connect with the Combination shaft, to the material advantage and benefit of both enterprises.

METALLURGICAL CAMPAIGN, HALL VALLEY, COLORADO.—Mr. Henry S. Bell, writing to *Iron* in reference to Mr. Jernegan's paper on the Hall Valley Smelting Works, published in the ENGINEERING AND MINING JOURNAL, vol. —, p. —, says: "Your journal contains a detailed description, by Mr. J. L. Jernegan, of a non-successful metallurgical campaign of the Hall Valley Smelting Works, Colorado, while under the superintendence of the late Mr. Howard Painter. Perhaps many of your readers will be interested in learning that, long before Mr. Jernegan published his paper, I had succeeded in solving the problem of smelting the Hall Valley ores. After the resignation of Mr. Painter, I was appointed manager of the company's mines and works in Colorado, and proceeded thither in the early part of last year, 1876. On arriving there, my first duty was carefully to inspect the nature of the ores to be treated, and the means that had been adopted for their treatment. The class of ore has already been fully described in your previous numbers. Suffice it to say that it was a rich argentiferous gray copper, with a small percentage of galena disseminated in a refractory gangue of heavy spar. To smelt this ore had been erected three large blast-furnaces of the Kast type, or modification of the Pilz, which were a facsimile of those used in the Hartz for the iron reduction process. Why this class of furnace should have been erected it is difficult to conceive, but perhaps the idea of the parties in charge was that one blast-furnace was equally as good as another. I beg to state here, in vindication of Mr. Painter, that he did not erect these furnaces; he merely endeavored to make use of those he found already at hand. To supply the blast to these high furnaces was one solitary Sturtevant's blower, making 800 to 900 revolutions per minute, supporting a column of mercury ¾ inch high. There was also, in addition to the above smelting plant, a small roasting-furnace. Before attempting any smelting operations, I proceeded at once to the alteration of one of the blast-furnaces by reducing its height from 23 feet to 12 feet from the mouth to the axes of the tuyeres, and the entire reconstruction of the hearth, and reducing the angle of the boshes from 85° to 90°. This not only allowed the charge to descend more regularly in the furnace, but, at the same time, greatly added to the capacity of the hearth. I increased the speed of the Sturtevant's blower up to 1400 revolutions per minute, obtaining thereby a much greater pressure of blast, quicker combustion, consequently greater heat, and, at the same time, limiting the work of reduction to the zone of fusion. Owing to the richness of the ore in silver, and the difficulty of separating the argentiferous gray copper from the heavy spar gangue seeing that their specific gravities are nearly the same, it was merely roughly hand-dressed, so that when crushed and ready for the furnace the average assays were 70 to 80 oz. silver to the ton, and 15 to 18 per cent. lead. The basic Hall Valley ores were now mixed with a given quantity of decomposed silicious vein matter, bearing silver, also with some bismuthic silver ores, having a silicious gangue, which can be purchased in the neighborhood; the object aimed at in the mixing was to obtain a double silicated slag, containing 30 to 34 per cent. SiO_2, somewhere between the formula of $2RO_1SiO_2$ and $4RO_1SiO_2$. The ore was now roasted in an ordinary calcining furnace. After the calcination, and before slagging near the firebridge, several shovelfuls of fine charcoal were thrown in at one of the side doors and well rabbled into each charge, in order to reduce as far as possible the $BaSO_4$ into BaS, thus: $2C + BaSO_4 = BaS + 2CO_2$. The BaS thus produced formed a good fusible slag for the subsequent process. The use of the carbonaceous matter will suggest to many the reduction of the PbO to Pb, but its presence was never detected in the shape of metallic shots in the roasted ore, or in any other form on the bed of the roaster, but analysis of the roasted ore showed that a large percentage of the heavy spar had been reduced. The agglomerated ore from the roaster, when cool, was broken up and charged into the blast furnace, a charge having the following composition:

Roasted ore	55	Limestone	1
Slag	39		
Matte	1		100
Fluorspar	4		

About 30 per cent. of pine wood charcoal was used in the smelting. The campaign commenced on the 15th June, and did not terminate till the 6th October, after a successful run of 114 days. In the early part of the campaign, when the blast-furnace had plenty of ore to work on, 5 to 6 tons of lead bullion were produced a week, assaying 400 to 500 oz. of silver, in addition to that about 2 tons of rich copper matte. The failures in the former campaigns were apparently due to the following causes: (1) The excessive height of the furnaces, not adapted for basic ores, and especially where much iron is in the charge. (2) Weak pressure of blast, in consequence of which the temperature in the zone of fusion was too low, and combustion not alone confined to the smelting region; the heat ascending the furnace caused a considerable portion of the fuel to be burnt before arriving in front of the tuyeres. The CO thus generated in the upper part of the furnace reduced the bog-iron ore, used as flux, to the metallic state, with the subsequent formation of accretions on the side of the furnace. (3) The employment of too much bog-iron ore as flux. Mr. Jernegan states that when the furnace was put in blast it worked very well for a few days, and then gobbed up. The explanation of the few days' good run may be sought in the use of the highly silicated slag obtained from Alma; but as soon as this became saturated with the excess of iron employed, then the furnace ceased to work. At the present moment the Hall Valley Works are not in operation. The furnaces were shut down at the latter part of last year, owing to financial difficulties, which prevented the development of this rich mining property, and at a time when a little additional capital would have brought the Hall Valley enterprise to a successful issue."

ASSAY DEPARTMENT OF THE ENGINEERING AND MINING JOURNAL.

This department is opened for the benefit of miners, prospectors, and others interested in minerals.

Replies will be made in these columns, and *without charge*, to questions asked regarding the natural and commercial value of minerals, and of samples sent.

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Where reply by letter is desired, an additional charge of 50 cents should be inclosed.

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ANSWERS.

Denver Office:

SAMPLES AND QUESTIONS.

107. JOHN EDGERTON, Bozeman, Montana.—The mineral is cerusite (carbonate of lead). It is a valuable ore of that metal, and probably contains some silver. The claim is worth having, especially being the size you mention.

108. E. W. R., Leeds, Utah.—Silver is found in sandstone in other places besides your camp. Still, it is more commonly met in limestone, quartzite, and granite.

109. R. W. POMEROY, Greeley, Colo.—The fire-clay sample sent is not pure enough for the manufacture of crucibles, etc. It contains too much iron and silica. The latter may be removed by washing, but it would make the material too costly. Search elsewhere along the outcrop for a purer quality of material.

110. JUDGE WOODS, Caribou, Colo.—The specimen arrived too late for critical examination this week. It is very rich in silver, and is not recognizable by the usual tests of physical qualities, owing to its amorphous condition, and also because you have ground it smooth. Would be obliged if you would send me a piece in the natural condition.

111. WM. PEDY, Breckenridge.—Magnetic iron; contains, probably, no gold or silver. Would be of use in smelting the heavy galenas of the locality.

112. WARD.—Your idea of roasting your ores in air-tight cylinders is not new by any means, but it is a common one. To roast ores air is necessary. Do you suppose heat alone is capable of doing everything you want with mineral? Knock out the ends of the machine, and perhaps you can do something. It would be better still to throw the machine away, and to spend what money you have in an enterprise of which you have some knowledge.

113. GEO. M. PARSONS, Cimarron.—Wire gold and silver is met with frequently. Concerning the mode of formation of the former, but little is known. Silver wires undoubtedly result from an alteration of sulphurets of silver; some think through electrical action, others through heat.

114. J. F. B., Georgetown.—Almost pure bed rock, of the species known as slightly metamorphosed gneiss. Its composition is identical with granite, viz. quartz, felspar, and granite. Gneiss is, however, a sedimentary rock.

ASSAYS.

115. J. W. R., Denver.—Silver, 151 oz.; copper, 3¼ per cent.

116. E. L., Central.—1. Gold, 4 oz.; silver, 13 oz. 2. Gold, 3 oz.: silver, 11¼ oz. 3. Gold, 6 oz.; silver, 28 oz. 4. Gold, 1½ oz.; silver, 10 oz.

117. P., Alma.—Silver, 484 oz.

118. A. G., Alma.—Silver, 109 oz.; gold, ¼ oz.

119. E. R. HORTON, Silverton.—Silver, 1142 oz.

120. CHAS. ANGLUM, Del Norte.—The set of specimens from the Summit District yielded as follows:—1. Gold, 3¼ oz. 2. Gold, 2¼ oz. 3. Gold, 14 oz. 4. Gold, 9½ oz. 5. Gold, 2⅝ oz. 6. Gold, 6½ oz. The gangue was quartz rock.

121. C. ALLEN, Georgetown.—Silver, 901½ oz.; lead, 8 per cent.

122. JOHN A. WHARTON, Bingham, Utah.—1. Silver, 26 oz.; lead, 44 per cent. 2. Silver, 23 oz.; lead, 29 per cent. 3. Silver, 84 oz.; lead, 60 per cent.

123. R. A. PARKER, Cimarron, N. M.—Gold, $32.50 per ton.

124. FOSTER, Cheyenne.—Lead, 4½ per cent.; silver, none.

New York Office:

ASSAYS.

XXV.	I. A. S.,	Wilkes-Barre.—	4·92 per cent. copper.
XXXI.	F.—	No silver.	
XXXVI.	J. S.,	Bostwick.—	Silver, 6·25 oz.
XXXVIII.	L. H.—	E 8.	No gold; no silver.
XXXIX.	"	E 9.	A trace of gold; 30·06 oz. silver.
XL.	"	D 3.	A trace of gold; 12·37 oz. silver.
XLI.	"	F 2.	A trace of gold; 12·99 oz. silver.

STATISTICS OF COAL PRODUCTION.

This is the only Report published that gives full and accurate returns of the production of our Anthracite mines.

Comparative Statement for the week ending July 14, and years from Jan 1st.

Tons of 2,240 lb.	1877.		1876.	
	Week.	Year.	Week.	Year.
Wyoming Region.				
D. & H. Canal Co.	50,557	1,188,277		920,256
D. L. & W. RR. Co.	64,137	1,218,443	39,200	690,712
Penn. Coal Co.	24,506	579,160	24,234	471,903
L. V. RR. Co.	27,126	540,797	22,916	463,270
P. & N. Y. RR. Co.	2,296	31,125	....	12,649
C. RR. of N. J.	11,478	802,618	31,905	588,273
Penn. Canal Co.	13,133	187,990	7,785	154,262
	193,233	4,548,410	126,040	3,301,325
Lehigh Region.				
L. V. RR. Co.	68,688	1,567,371	82,858	1,178,280
C. RR. of N. J.	37,864	802,779	30,528	573,524
D. H. & W. B. RR.	279	7,783	2,129	20,616
	106,831	2,377,933	115,515	1,772,420
Schuylkill Region.				
P. & R. R. RR. Co.	138,286	3,108,176	141,122	2,050,218
Shamokin & Lykens Val.	18,373	332,028	18,914	416,555
	156,659	3,440,204	160,036	2,466,773
Sullivan Region.				
Sul. & Erie RR. Co.	188	5,485	10	26,409
Total	456,911	10,372,032	401,601	7,566,927
Increase	55,310	2,805,105	....	....
Decrease	....	....	....	....

The above table does not include the amount of coal consumed and sold at the mines, which is about five per cent of the whole production.

Receipts and shipments of coal at Chicago, Ill., for the week ending July 14, and year from January 1:

	Week. Tons.	Year. Tons.
Receipts	32,215	759,600
Shipments	5,002	105,697

The shipments of coal at Cleveland, Ohio, for the week ending July 14 were as follows: shipped coastwise, 8,719 tons; total for year, 110,633 tons; foreign shipments, 2,730 tons; total for year, 41,382. Total of coastwise and foreign shipments for week, 11,449; for year, 152,015.

Receipts of Coal at Boston, for the week ending July 1 and years from Jan. 1.

Tons of 2,240 lb.	1877.		1876.	
	Week.	Year.	Week.	Year.
From				
Alexandria and Georgetown	5,457	34,859	1,895	22,51 7
Philadelphia	19,430	393,917	10,096	239,78 0
Baltimore	6,301	70,585	1,010	66,59 1
Other places	10,858	151,784	4,290	136,9 65
Great Britain	....	1,249	....	3,9 16
Nova Scotia	1,225	9,022	1,118	6,9 91
Total	43,471	571,416	18,409	476,760

Shipments of coal at Pictou, N.S., for the week ending July 14, and year from January 1:

	Week.	Year
To Canada	2,059	12,330
" United States	....	9,491
" Other Provinces	2,137	18,161
Total tons	4,196	39,982

Perth Amboy business:

	Tons.
Received for the week	27,926
Shipped for the week	26,122
On hand July 14	133,368

The decrease of shipments of Cumberland Coal over the Cumberland Branch, and Cumberland and Piedmont Railroads amounts to 76,816 tons, as compared with the corresponding period in 1876.

Belvidere Delaware RR. report for week ending July 14.	Week	Year. 1877.	Year. 1876.
Coal for shipment at Coal Port (Trenton)	473	11,410	116,279
" " " " South Amboy	9,419	336,175	218,504
Coal for distribution	3,274	90,638	74,994
Coal for Company's use	821	38,619	29,229

The production of Bituminous Coal for the week ending July 14, was as follows:

Tons of 2,000 lb., except where otherwise designated.	Week, Tons.	Year, Tons.
Cumberland Region, Md.		
Tons of 2,240 lb.	26,323	725,005
Barclay Region, Pa.		
Barclay RR. tons of 2,240 lb.	4,410	170,240
Broad Top Region, Pa.		
Huntingdon and Broad Top RR.	1,793	71,148
*East Broad Top	363	25,427
Clearfield Region, Pa.		
*Snow Shoe	245	21,819
*Tyrone and Clearfield	7,861	640,534
Allegheny Region, Pa.		
*Pennsylvania RR.	1,079	100,341
Pittsburg Region, Pa.		
*West Penn. RR.	887	94,063
*Southwest Penn. RR.	192	20,672
*Penn & Westmoreland gas coal, Pa. RR.	3,838	370,220
*Pennsylvania RR.	2,769	184,514

*For two days ending June 30.

The Production of Coke for two days ending June 30.

Tons of 2,000 lb.	Week.	Year.
West Penn. RR.	165	31,857
Southwest Penn. RR.	4,753	394,341
Penn & Westmoreland Region, Penn. RR.	277	39,585
Pittsburg, Penn. RR.	320	66,519
Total.	5,515	442,302

COAL TRADE REVIEW.

NEW YORK, Friday Evening, July 20, 1877.

Anthracite.

At last we have the official announcements that the Delaware, Lackawanna & Western Railroad Company will dispose of 110,000 tons of coal next Wednesday, and that on the same day the Pennsylvania Coal Company will sell 90,000 tons. These quantities are smaller than was anticipated, and it is thought that the prices of the last Scranton sale will be fully maintained, and perhaps an advance on some sizes be secured.

Upon the whole, the demand shows no improvement. Stove coal appears to be in slightly better request, while broken and egg sizes, although still in good demand, are not so active as for weeks back. A fear that some arrangement might be entered into by the coal companies whereby the price of coal would be advanced has undoubtedly kept up the demand; but when this idea becomes dissipated, as it surely will at an early day, there will be no great desire to push purchases, especially by those who can supply themselves during the winter months.

Mr. Gowen has had but little to say, since his return from Europe, about what he will do; but we are well informed that he positively refuses to enter any combination to regulate either prices or production—not even to adopt his own scheme (pooling all the competitive coal) which was proposed in good faith and refused as "impracticable." Without the co-operation of the Reading Company, there will be nothing for the several companies to do, but to manage their business in their own particular ways, and try to fight through until the demand approaches the supply, which must come from an increased consumption and a decreased production. The former will steadily be brought about by the natural growth of the country and low prices, while the latter will come from a loss of labor, owing to unprofitable employment, an exhaustion of mines now opened, and a failure to develop other ones, owing to the unprofitable nature of the business of coal mining.

The coal trade, like that of iron, will have hanging over it, for a long time, an excessive productive capacity, which will, from time to time, be brought into competition, preventing prices from reaching but little above the cost of producing and placing in market. This will operate very much to the disadvantage of the large companies who are overburdened with indebtedness, guarantees, etc., as the individual interests will always appear as competitors when there is but the slightest margin of profit, and while it will be necessary for some of the large companies to have quite a large profit to meet their charges.

The production of anthracite coal for the week ending July 14 was greater than during the previous week, although not up to the average of several weeks in June. Last week it was 456,911 tons; the previous week, 342,885 tons; and for the corresponding week of 1876, 401,601 tons. The output from January 1 to July 14 was 10,372,032 tons, as against 7,566,927 tons for the like period of 1876, showing an increase this year of 2,805,105 tons. The production on the line of the Philadelphia & Reading Railroad is falling off, owing to the inability of the individual operators to cover working expenses at the present prices of coal. If the Reading Company would hold its position, it must make a still further reduction in freights.

Bituminous.

There is no important business being done in bituminous coals. Clearfield continues a liberal output, although it does not appear to have benefited much as yet from Cumberland's misfortune. The shipments from the Cumberland region show a large decrease, the blockade of the Chesapeake & Ohio Canal having been supplemented by a strike among the employees of the Baltimore & Ohio Railroad, depriving the region of its two important outlets to market. The railroad strike has assumed formidable dimensions, all freight traffic being stopped, and the local authorities powerless to subdue the mob that has virtually taken possession of the line. Appeal has been made to President Hayes for military aid, and a body of troops has been sent to the scene of the difficulties.

Every consideration of public and private interest calls for the rigorous suppression of all lawless proceedings. It is doubtless true that the earnings of the laboring classes throughout the country are scanty, and in many instances barely sufficient to supply the necessaries of life; but all sympathy is forfeited when resort is had to violence or intimidation, either to enforce their own terms of employment, or to deter others from accepting the work and wages they refuse. It is to be regretted that so serious a labor disturbance should have broken out in a section of country where the oppressive policy of this great monopoly has deprived the corporation of that popular sympathy and regard for justice that in most other communities would have quickly arrayed themselves against unlawful violence and coercion. But it is to be hoped that the prompt action of the railroad and United States authorities will result in the speedy suppression of the disorder that is injurious alike to the interests of both capital and labor.

In this connection a good example has been set for the authorities of the Chesapeake & Ohio Canal. For several weeks this State-work has been, practically, in a condition of seizure. Some discontented boatmen, representing the trippage interests, have been quietly permitted to blockade the way and prevent those boatmen from pursuing their occupation who have been satisfied with the freights received. This strike, a relic of the old trippage abuse which has been exposed in these columns, would have been of but brief duration but for the encouragement and aid of those who have grown opulent from this extortion, and are unable to perceive that in the changed condition of business the opportunity has ceased for its further practice. Instead of furnishing means and food for the maintenance of a condition of violence that prevents men from engaging in work that is offered and which they are willing to do if unmolested, a more practical direction might be given to the charities of Cumberland by giving this aid to the unemployed hundreds in that city who are unable to find work at any price, and are now making public appeals for employment or assistance. The inevitable result of the stoppage at the canal must be a considerable loss of business to the Cumberland region and increased hardships to all dependent upon it. This trade has been maintained with difficulty in the face of the severe competition from other coals, and any material advance in canal freights would leave the boatmen but little or nothing to do, and thus defeat their object. It is reported that several of the companies usually shipping by canal will ship largely by rail to Baltimore as soon as that outlet is again opened. If the canal and State authorities neglect much longer to disperse the obstructionists at St. John's Run, and guarantee the unmolested freedom of the canal to the competition of all boatmen wishing to freight upon it, an irreparable injury will be inflicted upon the Cumberland and canal interests. It is a folly to encourage a few malcontents in a blind and unlawful course that, if further persisted in, must seriously impair the chief labor-field of a large community.

New York.

Wholesale Prices of Bituminous Coal.

Wholesale Prices of Anthracite Coal f. o. b. at the Tide Water Shipping Ports per ton of 2240lb.

	Lump.	Steamer.	Grate.	Egg.	Stove.	Chestnut.
Wyoming Coals.						
‡Lackawanna at Rondout	2 50	2 50	2 60	2 60	2 60	2 60
*Scranton at Hoboken	....	2 18	2 26	2 41	2 55	2 35
Wilkesbarre at Port Johnston	2 65	2 65	2 65	2 65	2 75	2 60
Plymouth, R. A.	....	....	2 65	2 65	2 85	2 70
Susque: Coal Co., (S. H. Brown & Co.,) At Amboy	2 50	2 50	2 60	2 65	2 75	2 60
Kingston at Hoboken	2 50	2 50	2 60	2 65	2 75	2 60
Pittston at Newburgh:						
A. S. Swords	2 50	2 50	2 50	2 50	2 60	2 50
*Penn. Coal Co	2 51	2 47	2 50	2 48	2 51	2 45
Wyoming at Perth Amboy	....	2 65	2 65	2 65	2 75	2 75
Lehigh Coals.						
Old Company at port Johnston	3 25	....	2 85	2 85	2 75	2 60
Old Company's Room Run "	3 25	....	2 85	2 85	2 75	2 60
Sugar Loaf, Hobok. & Amb."	3 25	....	2 85	2 85	2 75	2 60
Lehigh at Perth Amboy	3 25	....	2 85	2 85	2 75	2 75
Honey Brook Lehigh	3 25	....	2 85	2 85	2 75	2 60
Mount Pleasant at Hoboken	3 25	....	2 85	2 85	2 85	2 75
Cross Creek at Port Johnston	2 65	2 65	2 75	2 75	2 75	2 60
Schuylkill Coals *at Port Richmond, Philadelphia.*						
Schuylkill white ash	....	....	....	....	....	....
Schuylkill red ash	....	....	....	....	....	....
Lorberry	....	....	....	....	....	....
Lykens Valley	....	....	....	....	....	....

‡Boats towed by the D. & H. Co. at its expense to and from New York Harbor.

* These quotations represent the average prices of the last auction sale

Per ton.

Freight from Hoboken and Weehawken to New York.35c.
" " Elizabethport & Port Johnston to N. Y.35c.
" " South Amboy to New York.35c.

Freight by the boats of the companies from Hoboken, Rondout, Port Johnston, Weehawken, South Amboy and Perth Amboy to New York City and vicinity 50c.

Pittston coal at New York delivered by Penn. Coal Co.'s boats 60c. per ton additional.

Lackawanna coal delivered to carts in New York or Brooklyn, 50 cents per ton additional.

Domestic Gas Coals.

Per ton of 2240 lb.	At the Shipping Ports.	Alongside in New York.
Westmoreland and Penn. at Greenwich, Philadelphia	$4 50	$5 50
" " at S. Amboy.	5 00	5 50
Red Bank Cannel Pa. at Philadelphia..	8 00	8 50
Youghiogheny, Waverly Co., at Balt...	4 50	5 65
Despard, West Va.	4 50	6 00
Murphy Run, West Va., at Baltimore...	4 50	5 85
Fairmount, West Va., " " ..	4 40	5 70
Newburg Orrel, Md. " " ...	4 50	6 00
Cannelton Cannel, West Va.	....	10 00
" Splint " at Richmond.	6 00	7 00
" Gas Coal at Richmond.....	4 00	5 65
Peytona Cannel W. Va. at Richmond...	....	10 00

Manufacturing and Steam Coals.

Cumberland at Georgetown and Alexandria, Va.	2 85@3 00	4 00
Cumberland, at Baltimore	3 15@3 25	4 50
Clearfield f. o. b. Canton, Baltimore	3 25@....	4 50

Clearfield "Eureka" at mines per ton 2,000 lb., 75c.; f.o.b. Baltimore and Philadelphia per ton of 2,240 lb., $3.25; f.o.b. South Amboy, $4.25; alongside at New York, $4.50.

Foreign Gas Coals.

	Sterling.	Am. cur'cy
Newcastle, at Newcastle-on-Tyne	8/6@10/6	5 50@ 6 00
Liverpool House Orrel, at Liverpool	25/	13 00
Ince Hall Cannel "	35/6	18 00
" Gas Cannel "	25/6	10@10 50
Scotch Gas Cannel, at Glasgow, nominal,	25/	7 50
	Gold.	
Block House, at Cow Bay, N. S.	1 75	4 50
Caledonia, at Port Caledonia	1 50	4 25
Glace Bay, at Glace Bay	1 60	4 25
Lingan, at Lingan Bay	1 75	....
International mines at Sydney	1 75	4 50
Pictou, Vale mines, at Pictou	2 15	....

Retail Prices in New York.

Anthracite.

Per 2000 lbs.	Grate and Egg.	Stove.	Chestnut.
Pittston coal, in yard	$3 25	$3 50	$3 25
Lackawanna coal, delivered	3 75	3 75	3 75
Wilkes-Barre, delivered	4 30	4 60	4 30
Lehigh and Locust Mountain, del'd..	4 55	4 85	4 55
Schuylkill Red Ash, del'd.	5 25	5 50	4 75

The Cost of delivery for Pittston coal ranges from 40cts. to $1 10 per ton, according to distance from the yard.

Bituminous.

Liverpool House Orrel, delivered, per ton of 2000 lb				$18 00
Liverpool House Cannel	"	"	"	.... 18 00
American	"	"	"	.... 11 00
Cannelton Block, or splint,	"	"	"	.... 10 00
American Orrel	"	"	"	.... 11 00
Red Bank Cannel	"	"	"	.... 9 00
Cumberland	"	"	"	.... 7 00

Baltimore. July 19, 1877.

Specially reported by Messrs. E. STABLER Jr., & Co.

Wholesale Prices.

AFLOAT BY CARGO PER TON OF 2,240 LB.

Lump and Steamboat	$3 40	Stove	$3 65
Broken	3 25	Chestnut	3 40
Egg	3 30		

In cars in dealers' yards or on switch, 15c. per ton additional.

Lykens Valley Red Ash.

AFLOAT BY CARGO.		BY RAIL IN CARS.	
Broken	$3 98	Broken	$4 15
Egg	4 13	Egg	4 30
Stove	4 13	Stove	4 30
Chestnut	3 36	Chestnut	3 80

From wharf or yard to the trade, 50c. per ton additional.

Bituminous.

George's Creek, f. o. b. at Locust Point	$3 50 to $3 60		
Clearfield, " Canton	3 30 to 3 40		

Boston. July 14, 1877.

Coal is dull and unchanged. The announced placing of a mortgage by the Delaware & Hudson Canal Company, in connection with that of the Delaware, Lackawanna & Western, is confirmatory of the views of those who think a new combination is not at all likely. Production continues very large. There is a better demand for broken and egg than for stove and chestnut sizes. This is partly attributable to manufacturers changing from anthracite to bituminous. Freights are dull, quoting from New York, $1@1.10, from Baltimore, $1.30@1.40, from Alexandria and Georgetown $1.50@1.60, and from Philadelphia, $1.20@1.25.

We quote Boston wholesale prices as follows:

Anthracite, broken	$3 75@3 90	Cannel, English	$16 00
do. egg	3 75@3 90	do. Buckeye	10 00
do. stove	4 00	Lingan	4 00
Cumberland	4 25	Pictou	5 00
Clearfield	4 00	Penn	5 50
Westmoreland	5 50	Youghiogheny	4 50@5 50
Caledonia	4 00		

—*Commercial Bulletin.*

Buffalo. July 19, 1877.

Specially reported by LEE & LOOMIS.

	Lump.	Run of Mine.	Nut.	Slack.
Connellsville Coke	$5 00	....	.....	....
Brookfield Coal	4 15	....	.....	....
Brier Hill	4 00	....	2 85	....
Youghiogheny	4 00	....	.....	....
Monterey	3 25	3 00	.....	2 25
Catfish			.....	
Stoneboro'	....	....	2 75	2 25
		broken		
Sterling Cannel	5 00	4 75	4 50	....
			nut & slack	
Reynoldsville	3 25	3 00	2 65	2 25
Buffalo Coal Company	....	3 00	.....	2 25

The Scranton, Wilkes-Barre, Plymouth, Shamokin, and Delaware and Hudson (Lackawanna) are offered for the present at the following prices per ton of 2,000 lb.:

Delivered at	Elmira.	Ithaca.	Syracuse.	Rochester	
	Afloat.	Afloat.	Afloat.	Afloat.	Ret. Del.
Lump	....	....	....	....	....
Grate	$3 50	$2 85	$2 85	$3 10	$4 35
Egg	3 50	2 95	2 95	3 20	4 45
Stove	3 75	3 20	3 20	3 45	4 70
Nut	3 75	3 10	3 00	3 25	4 50

Delivered at	Oswego	Erie.	Buffalo.		
	F. O. B.	F. O. B.	Afloat.	F. O. B.	Ret. Del.
Lump	....	....	....	....	....
Grate	$3 25	$3 75	$3 35	$3 75	$4 60
Egg	3 35	3 85	3 45	3 85	4 70
Stove	3 60	4 10	3 70	4 10	4 95
Nut	3 40	3 90	3 50	3 90	4 75

Cost of coal from Erie, Oswego, Sodus Point, or Charlotte for Western market, same as if shipped from Buffalo. Terms cash. All payments to be made in New York city funds:

Chicago, Ill. July 17, 1877.

Specially reported by Messrs. RENO & LITTLE.

The following are the prices to-day for coal:

Lackawanna Stove	$6 00	Erie and Brier Hill	$5 50
" Chestnut	6 00	Wilmington and Ill.	3 50@4 00
" Grate and Egg.	5 75	Blossburgh	6 50

Cincinnati, O. July 17, 1877.

Specially reported by the Consolidated Coal and Mining Co.

	AFLOAT. Per bush.	per ton 2,000 lb.	DELIVERED. Per bush.	per ton 2 000 lb.
Youghiogheny lump	7c.	$1 94	10c.	....
" nut	5½c.	1 53	9c.	....
" slack	4½c.	1 25	8c.	....
Camden, W. Va.	5½c.	1 53	9c.	....
Peytona Cannel	16c.	4 57	20c.	....
Connellsville coke	7c.	3 60	10c.	....
Youghiogheny coke	5c.	2 64	8c.	....
Crushed coke	....	....	10c.	....

Anthracite, Wilkes-Barre or Lehigh by car load.....$6 00
" " " delivered..7 co@7 50

Cleveland, O. July 17, 1877.

Specially reported by Messrs. LAMBIE & BATES.

Per ton of 2000 lbs. f. o. b. vessels.

WHOLESALE.

Brier Hill (Church Hill)	3 50
" No. 2 Grades	3 35@3 40
Straitsville Lower Vein	2 80
Hocking Valley	2 80
Massillon	2 85
Mineral Ridge (Cambria Mine)	2 85
Tuscarawas Valley	2 30
Columbiana	2 30
Nut coal, various grades	2 20@2 50
Screenings, " "	1 35@1 75
Youghiogheny gas coals	3 75@3 85

The following are the prices established by the Coal Exchange until further notice:

RETAIL TRADE.

	1 to 10 tons.	10 tons. upw'd.
Brier Hill lump	$4 25	$4 00
" " nut	3 75	3 50
Massillon and Mineral Ridge lump	4 00	3 70
" " " " nut	3 75	3 55
Straitsville Lower Vein, Hocking & Shawnee l'p.	3 60	3 35
" " " " nut	3 40	3 15
Del Carbo lump	3 75	3 50
" " nut	3 50	3 25
Rich Hill lump	3 50	3 35
" " nut	3 25	3 00
Columbiana, lump	3 25	3 00
" nut	2 75	2 50
Lacka'a., Wilkesbarre and Pittston egg and grate,	7 00	6 75
" " " stove	7 50	7 25
" " " chestnut	7 00	7 15

Lehigh $1 25 per ton higher.

All sales to be strictly cash with order or C. O. D.

Hamilton, Ont. July 16, 1877.

Specially reported by H. BARNARD.

I beg to hand you state of our market corrected to date.

Grate	$4 50	Lehigh Lump	$5 30
Egg	4 50	Brier Hill	5 00
Stove	4 75	Massillon	4 50
Nut	4 75	Blossburgh	5 50

Indianapolis, Ind. July 17, 1877.

Specially reported by Messrs. COBB & BRANHAM.

Wholesale on board cars, and retail delivered to consumers

BITUMINOUS.

White River, per ton	$ 2 50	Peytona Cannel, per ton	$ 5 75
Brazil Block, "	2 25	Indiana Cannel	4 50
Highland, grate, "	2 00	Hocking Valley	4 25
Block coal, nut, per car.	18 00	Youghiogheny	4 50
Highland " "	18 00	Blossburg (smithing)	6 50
Block Slack " "	17 00	Piedmont "	6 50
		Gas Cake, per bushel	10

ANTHRACITE (Lackawanna and Wilkes-Barre).

Broken	$7 60	Nut	$6 70
Egg	7 60	Stove	6 70

Lehigh Anthracite.

Broken	$7 60	Nut	$7 30
Egg	7 60	Stove	7 70

Retail, per bushel, delivered.

Sand Creek	13c.	Block Nut, steam	8c.
White River	13	" Slack, "	0
Brazil Block	13	Virginia Cannel	27
Highland Grate	11	Youghiogheny	16
Block Nut, domestic use.	11	Blossburg	26
Highland Nut, " "	11	Piedmont	26
" " steam	8		

GAS COKE (measured.)

Crushed	14c.
Lump	12c.

ANTHRACITE.

Wilkes-Barre and Lackawanna (all sizes)	$7 50 per ton.
Lehigh, retail	8 50 per ton.

Louisville, Ky. July 17, 1877.

Specially reported by Messrs. BYRNES & SPEED.

Below find latest quotations:

WHOLESALE.

Pittsburg	7c. per bush.	Pine Hill	8½c. per bush.
Raymond City	7c. "	Kentucky	7½c. "

RETAIL.

Pittsburg	11c. per bush.	Pine Hill	11c. per bush.
Raymond City	10c. "	Kentucky	10c. "
Indiana Cannel	17c. "	Honeywell Can'l.	19c. "
City Make Coke	8c. "	Anthracite	$8 50 to $9 per ton.

Montreal. July 16, 1877.

Market for all descriptions of coal unusually quiet The importations of bituminous coal are greatly reduced, few cargoes being on the way.

Specially reported by Messrs. ROBERT C. ADAMS & Co.

Scotch Steam	$4 25	Cape Breton Steam	$3 75
Pictou	4 00	Newcastle Smiths	5 00

Anthracite at retail, per 2,000 lb. delivered.

Egg	$4 60	Chestnut	$4 70
Stove	4 80		

Milwaukee, Wis. July 16, 1877.

Specially reported by Messrs. R. P. ELMORE & Co.

Retail price per ton of 2,000 lb.

Anthracite, egg, chestnut, and stove.....$5 50

Wholesale price per ton of 2,000 lb.

Lehigh lump	$6 50	Connellsville coke on RR. track	$7 25

New Orleans, La. July 16, 1877.

Specially reported by Messrs. C. A. MILTENBERGER & Co.

PITTSBURG COAL.

At wholesale (by boat load)	35c. per bbl.
To steamboats	40c. "
" manufactories	50c. "
" families	65c. "
In hhds. (for shipment)	$6 00 per hhd.

ANTHRACITE COAL.

At wholesale	$7 00 to 8 00 per ton.
" retail	11 00 "

VIRGINIA CANNEL COAL.

At retail	$1 00 per bbl.

ST. BERNARD (KY.) COAL.

To steamboats	40c. "
" families	55c. "

Pittston, Pa. July 19, 1877.

Pennsylvania Coal Company's Coal in yard, ton of 2000 lb.

Retail.

Lump, Egg and Stove	$2 25
Chestnut	2 00
Pea	1 00

Delivered, fifty cents per ton additional

Richmond, Va. July 19, 1877.

Specially reported by S. H. HAWES, Dealer in Coal.

Per ton of 2,240 lb., f. o b.

Kanawha Cannel	$9 00	New River Bituminous	$3 60
Coalburg Splint	5 70	Clover Hill Coal	3 00
Lewiston "	5 70	James River Bitum	3 50
Kanawha Gas Coal	4 90	" " Carbonite	5 25

Sandusky, O. July 17, 1877.

Specially reported by C. E. BLACK, Agt. Con. Coal & Mg. Co.

We quote coal on cars at Sandusky, as follows:

Per ton of 2,000 lbs.

Anthracite.

	Grate.	Egg.	Stove.	Chestnut
Wilkes-Barre	$4 80	$4 80	$4 80	$4 80
Lackawanna	4 80	4 80	4 80	4 80
Lehigh	5 80	5 80	5 80	5 80

Bituminous.

Massillon	$2 90	Straitsville	$2 65
Del Carbo	2 65	Shawnee	2 65
Hocking Valley	2 65	Blossburg	4 75

Prices f. o. b. vessel for soft coal, 15c. advance on car prices. Prices retailed delivered 50c. above car prices.

San Francisco, Cal.

From the *Commercial Herald* of July 12, 1877.

COAL—Imports from January 1 to June 16:

	Tons.		Tons.
Anthracite	9,602	Vancouver Island	43,705
Australian	28,390	Rocky Mountain	113
Coos Bay	17,079	Saghalien	40
Cumberland	7,845	Seattle	55,051
English	40,734	Bellingham Bay	6,200
Chili	3,951	Ione, Cal.	764
Mt. Diablo,	39,995		

The receipts of California from the Monte Diablo Mines for the six months past show a falling off of 20,000 tons as compared with the like period of last year. But the total supplies from all quarters both home and foreign do not vary more than 5,000 tons less than same time in 1876. The sum total received is about 234,000 tons. The Seattle Mines, Washington Territory, are more than making good the falling off in all other Pacific Coast mines, while the Wellington and Nanaimo Mines of Vancouver Island are sending increased supplies. The general market is sluggish. Egg size Pacific Coast bituminous is selling by the cargo at $5@5.50 per ton, while coarse kinds of Seattle, Nanaimo, Wellington, Coos Bay and Bellingham Bay screened may be quoted at $7.50@8 per ton, according to quantity. Black Diamond and other California Mt. Diablo coals $5.75@7.75 for fine and coarse respectively. Prices of Scotch and English steam to arrive may be quoted at $8.50@9; West Hartley $9@9.50.

St. Louis, Mo. July 17, 1877.

Reported by JAS. J. SYLVESTER, Secretary of the Anthracite Coal Association.

Retail prices, delivered. Ton of 2,000 lb.

	ANTHRACITE.		per ton.
Lackawanna	$8 00@8 50	Schuykill	8 00@ 8 50
Wilkes-Barre	8 00@8 50	Lehigh	9 00@ 9 50
	BITUMINOUS.		
Blossburg	9 00	Big Muddy	3 00
Pittsburg	4 50	Illinois Coals	2 50@3 00
Indiana Block	4 00	Connellsville Coke.	6 50

Toledo, Ohio. July 17, 1877.

Specially reported by Messrs. GOSLINE & BARBOUR.

We report prices of coal on cars at Toledo as follows:

Ton of 2,000 lb.

Straitsville lump	$2 70	Hocking Valley nut	2 30
" nut	2 30	Massillon lump	3 00
Shawnee lump	2 70	Cumberland	5 40
" nut	2 30	Blossburg	5 40
Hocking Valley lump	2 70		

	Grate.	Egg.	Stove.	Chestnu
Pittston	$4 95	$4 95	$5 20	$5 10
Wilkes-Barre	4 95	4 95	5 20	5 10
Lackawanna	4 95	4 95	5 20	5 10

For retail delivery in city the prices are as follows: Stove and chestnut $5.75; grate and egg, $5.50 per ton.

Prices soft coal f. o. b. vessel for Lake shipments will be from 15 to 20c. per ton more than prices on cars.

Rates of Transportation on Anthracite Coal.

Rates of Freights on Pittston Coal from Newburgh, and Lackawanna Coal from Rondout. By Company's Boats per ton of 2240 lb.

	cts.
Troy and West Troy; if discharged above the bridge or locks, or at railroad docks	55
Troy and West Troy, except as above	50
Albany, Greenbush and Castleton. Stuyvesant, Coxsackie, (lower dock), Catskill, (at mouth of Creek), Germantown	55
Coeyman's	55
Hudson & Boston Railroad Dock, Hudson, discharged to cars	55
Hudson, (except as above)	45
Saugerties, (at mouth of Creek), and Glasco, Barrytown, Peekskill, (River Docks), Haverstraw (Peck's Dock), and Grassy Point	40
(If boats are moved from Peck's Dock to adjacent points, and returned there within two days, without expenses to the Company, no extra charge will be made.)	
Rhinebeck, and Hyde Park, Poughkeepsie and New Paltz Landing	30
Fishkill Landing, Cornwall, Cold Spring, West Point and New Windsor	25
Nyack, Sing Sing, Croton Landing, Verplancks, Tarrytown, Piermont, Yonkers	45

Rates of Transportation on Coal via the Erie Canal, from New York and shipping points in its vicinity, per ton of 2,240 lb., alongside at destination.

	Miles from Albany.	Freights. Cents.	Tolls. Cents.		Miles from Albany.	Freights. Cents.	Tolls. Cents.
To Albany	....	40	....	To Oswego	204	60	11'4
" Troy	7	40	0'4	" Rochester	259	53	14'5
" Utica	110	50	6'1	" Lockport	321	60	17'9
" Syracuse	166	50	9'3	" Buffalo	352	60	19'7

For freights on *Pennsylvania & New York Railroad* we refer to our issue of July 14.

For freights on coal *via Geneva, Ithaca and Sayre Railroad* we refer to our issue of July 14.

For freights on *Anthracite Coal to Tide Water Ports* we refer to our issue of July 7.

For freights on *Schuylkill Coal* we refer to our issue of July 7.

For freights on *Lehigh and Wyoming Coal* we refer to our issue of July 7.

Towing.

For rates of towing we refer to our issue of July 14.

Rates of Toll

On the Erie, Champlain, Oswego, Cayuga, and Seneca Canals.

Toll is to be computed upon the weight, 1,000 lb. per mile.

	Cents.		Cents.
Acid, sulphuric	0'1	*Iron & steel in sheets, bars, and bundles	0'1
*Car axles	0'1	Iron ore	0'025
Car wheels (iron)	0'05	" bloom and pig	0'05
Castings, all iron castings	0'1	* " boiler	0'1
Cement, fireproof	0'1	* " bridge and railing	0'1
Clay	0'05	* " bolts	0'1
Coal	0'025	Lime, manufactured	0'1
Coal oil	0'05	Lumber	0'25 to 1'25
Copper ore, pig and smelted	0'05	Petroleum, crude or refined	0'05
Fire-brick	0'05	Powder & gunpowder	0'4
*Gas pipes	0'05	Salt, foreign	0'25
Gypsum, ground and unground	0'1	" manufactured in New York State	0'05
Gypsum, product of New York State	0'05	Slate	0'05
Iron, articles exclusively manufactured of wrought iron not specifically enumerated when cleared at tidewater	0'05	Stone	0'05
		Tin plates, going from tidewater	0'05

* The rate on these articles, when cleared at tide water, is 0'05 cent.

Lead, bar and pig, is transported free of toll.

Freights

Representing the latest actual charters up to July 19.

Per ton of 2240 lb.

PORTS.	From Philadelphia.	From Baltimore	From Georgetown.	From Elizabethport, Port Johnson, South Amboy, Hoboken and Weehawken.
Augusta, Me.	1 75	....	....	1 50
Albany	....	....	....	....
Alexandria, Va	....	....	....	....
Annapolis, Md	....	....	....	....
Bangor, Me	....	....	....	90
Bath, Me	....	1 25	....	1 00
Baltimore	50@60	....	....	....
Boston, Mass.	115@135	1 30	....	90
Bridgeport, Ct	...	1 25	....	50
Bristol, R. I	....	..	....	80
Beverly, Mass	....	..	....	1 00
Cambridgeport, Mass.	1 20	....	....	90
Charleston, S. C	1 00	....	....	....
Danversport, Mass	1 20†	....	....	....
East Greenwich, R. I.	....	....	....	....
Fredericksburg, Va.	....	....	....	....
Fall River	....	1 13	....	80
Gloucester	100@120	..	....	....
Hingham, Mass	1 25	....	....	....
Hartford, Conn	....	....	....	....
Hoboken	....	....	....	35
Hudson	....	....	....	....
Jersey City	....	....	....	35
Lynn, Mass.	1 25	..	....	....
Medford, Mass.	....	....	....	....
Middletown	....	....	....	....
Marblehead, Mass	....	....	....	....
Nantucket, Mass	1 30	....	....	80
New Bedford	110@112½	1 25	....	80
Newburyport	...	1 40	....	1 00
New Haven	....	1 13	....	50
New London	....	1 13	....	....
Newport	....	....	....	80
New York	90†	1 00	....	35
Norfolk	50	50	....	75
Norwalk	....	....	....	50
Norwich	1 10	....	....	....
Pawtucket	115@125	....	....	90
Philadelphia	....	....	....	....
Portland	1 00	1 25	....	90
Portsmouth, N. H.	120@125	1 40	....	....
Providence	1 10	1 13	....	....
Poughkeepsie, N. Y.	....	....	....	....
Quincy Point, Mass.	....	....	....	....
Richmond, Va	50@60	....	....	....
Salem, Mass.	....	1 30	....	90
Saugus, Mass	....	....	....	....
Saco, Me	....	....	....	....
Somerset, Mass	....	....	....	....
Thomastown, Me.	....	....	....	....
Troy	....	....	....	....
Trenton, N.J	....	....	....	....
Washington	55	....	....	....
Wilmington, N.C.	....	....	....	....
Wareham	....	1 35	....	....

* And discharging and towing. † And discharging. ‡ And towing. § 3c per bridge extra.

Freights on Bituminous Coals from the Mines to Tide Water Shipping Ports.

From the Mines to Piedmont, Cumberland or State Line, 4c. per ton of 2,240 lb. per mile on distances less than 4 miles, and 3 cents per ton per mile on distances over 4 miles, and 2 cents per ton per mile on distances over 100 miles.

From Piedmont to Baltimore (206 miles), $1.85 per ton of 2,240 lb., or $1.65 per net ton.

From Cumberland to Baltimore (178 miles), $1.54 per ton of 2.240 lb., or $1.37 per net ton (¼ cent. per ton per mile for use of hoppers over C. & P. RR.).

From Cumberland to Georgetown (152 miles) by canal, 70c.@ 90c. Tolls 40c.

From Osceola to Greenwich, Phila. (say 248 miles, per T. & C. RR. per ton bituminous coal of 2,000 lb, less drawback, $1.90@ $2.15.

From Osceola to South Amboy, N.J. (317 miles), per 2,000 lb., $4.03, less drawback, $1.28; net rate per ton of 2,000 lb., $2.75; net rate per ton of 2,240 lb., $3.08; transhipment charges 20 cents additional.

IRON MARKET REVIEW.

New York.

FRIDAY EVENING, July, 20 1877.

American Pig.—We are reported a sale of 400 tons of No. 1 foundry on private terms. The market is reported very quiet by nearly all, and it is quite evident that but little business can be done, unless at a concession. The indications are very clear that our iron masters will not have to pay more for coal than at present, while it is possible that they will get it even lower than now. Prices are nominal. We quote as follows: No. 1 foundry, $18@19; No. 2 foundry, $17 @18; and forge, $16@17.

Scotch Pig.—This article is exceedingly quiet. We quote, nominally, as follows: Eglinton, $24; Coltness, $26.50; and Glengarnock, $25.

Rails.—No further business is reported, although there are some negotiations reported as under way. We continue to quote iron rails, at mills, at $33@36; and steel at $44@46.

Old Rails.—There is no business reported, although there has been an offer made for a large quantity which has not yet been rejected. We quote, nominally, at $19.

Scrap.—No. 1 wrought is without business, and nominally quoted at $23@24.

Baltimore, Md. July 16, 1877.

Specially reported by Messrs. R. C. HOFFMAN & Co.

The iron market continues dull with but little doing. Prices remain unchanged.

Baltimore Charcoal	$29@31	Mottled and White	$15@16 00
Virginia Charcoal	28@31	Charcoal C. B. Blooms	45@50 00
Anthracite No. 1	19@20	" " Billetts.	55@60 00
" " 2	18@19	Refined Blooms	45@50 00
Anthracite No. 3	17@19	Scrap Blooms	43@45 00

Boston. July 14, 1877.

Pig is extremely dull, and to make sales concessions have to be given. We quote $22@$23 for No. 1, $21@$21.50 for No. 2, and $20.50@$21.50 for gray forge. Scotch pig is dull at $24@$30 for store lots.

Bar is dull, quoting $46@$47 for refined, and $37@ $38 for common. Nails are in light demand at unchanged prices. Sheet is selling at 3c.@3¾c. per pound. Russia is quiet at 12c. currency. We quote English spring steel 7@8c. gold; 9@11c. for German; 9@11c. for machinery; 14@15c. for cast; 10@12c. for blister; 8c. for American spring; 13½@14c. for cast; 9c. for blister; and 8c. for machinery.—*Commercial Bulletin.*

Chattanooga, Tenn., July 17, 1877.

Specially reported by J. F. JAMES, dealer in pig iron, ores, etc.

The demand for mills and foundry grades during the past week has been fairly active. I have to report sales of 300 tons of charcoal No. 1 mill pig iron for Ohio, 100 ton lot to one New Orleans foundry, and the usual car load shipments South and Southwest, amounting to about 200 tons all prompt delivery and at satisfactory prices. I quote f. o. b. at furnaces.

Tenn., Ala. and Ga. Charcoal, No. 1 Foundry	$18 00@19 00
Tenn., Ala. and Ga. Charcoal, No. 2 Foundry	17 00@18 00
Tenn, Ala. and Ga. Charcoal, Gray Forge	15 00@16 00
Tenn., Ala. and Ga. Coke, No. 1 Foundry	19 00@20 00
Tenn., Ala. and Ga. Coke, No. 2 Foundry	17 00@18 00
Tenn., Ala. and Ga. Coke, Gray Forge	16 00
Charcoal or Coke, white and mottled	14 00@15 00
Tenn., Ala. and Ga. Cold Blast (car wheel)	22 00@28 00
Old rails 18 00@19 00 / Old car wheels 16 00@17 00 / Wrought scrap, No. 1 17 00	Wrought scrap, No. 2 12 00 / Cast scrap 10 00 / Muck bar 32 00@33 00
Iron Ores.	
Red Hematite (about 55 per cent. metallic iron) f. o. c. at mines	1 25
Brown Hematite (about 55 per cent. metallic iron)	1 75

Cincinnati, O. July 17, 1877.

Specially reported by Messrs. TRABER & AUBERY, commission merchants for the sale of pig iron, blooms, ore, etc.

Below we hand the closing quotations of our pig iron market.

CHARCOAL.	
Hanging Rock A1 Extra	$25 00@25 50—4 mos
" No. 1 Foundry	$24 00@ ....—4 mos
" No. 2 "	22 00@22 50—4 mos
" Soft Silver Gray	22 00@22 50—4 mos
" Mill	20 00@21 00—4 mos
Tennessee, No. 1 Foundry	23 00@23 50—4 mos
" " 2 "	22 00@22 50—4 mos
" Mill,	20 00@21 00—4 mos
STONE COAL.	
Ohio, No. 1 Foundry	21 50@ ....—4 mos
" " 2 "	20 50@ ....—4 mos
" Silvery	19 50@ ....—4 mos
" Mill	@ ....—4 mos
COKE.	
Ohio & W. Va. No. 1 Foundry	@ ....—4 mos
" " " 2 "	@ ....—4 mos
" " Mill	@ ....—4 mos
CAR-WHEEL.	
Hanging Rock, C. B. Car Wheel	38 00@40 00—4 mos
Tennessee, "	30 00@ ....—4 mos
Missouri, "	30 00@33 00—4 mos
Alabama, "	30 00@35 00—4 mos
BLOOMS.	
Charcoal	50 00@ ....—cash.
SCRAP IRON.	
Cast	50c.@ 65c.— "
Wrought	75c.@ 90c.— "

Cleveland, O. July 13, 1877.

Specially reported by Messrs. C. E. BINGHAM & Co.

Per gross ton, on four months' time. Subject to change in market. Discount for cash 4 per cent.

FOUNDRY IRON.			
No. 1, L. S. Charcoal	$26 00	Am. S., No. 1, Ch Val.	$24 00
No. 2, " " "	25 00	" " B. 1, " "	22 00
No. 1, Anthracite	24 00	" " No. 2, " "	21 00
No. 2, "	22 00	No. 1, Massillon	24 00
No. 1, Bituminous	24 00	B—1, "	22 00
No. 2, "	22 00	No. 2, "	20 00
CAR WHEEL AND MALLEABLE IRON.			
No. 3 L. S. Charcoal	27 00	No. 5 & 6, L. S. Charcoal	$27 00
No. 4, " " "	27 00		
BESSEMER IRON.			
Nos. 1 & 2, L. S. Char.	$26 00		
FORGE IRON.			
No. 1, Gray	$19 00	White and Mottled	$18 00

Louisville, Ky. July 17, 1877.

The market is dull and lower. We revise quotations as below. Sales of round lots can only be made at the inside figures. The usual time, four months, allowed on quotations below.

Specially reported by Messrs. GEORGE H. HULL & Co.

FOUNDRY IRONS.	
No. 1 Hanging Rock, Charcoal	$23 00@24 00
No. 2 " " "	20 00@21 00
No. 1 Southern Charcoal	20 00@21 00
No. 2 " "	19 00@20 00
No. 1 Hanging Rock, Stonecoal and Coke	20 00@22 00
No. 2 " " " " "	19 00@20 00

No. 1 Southern Stonecoal and Coke	19 00@20 00
No. 2 " " " "	18 00@19 00
"American Scotch"	20 00@22 00
Silver Gray	18 00@19 00
MILL IRONS.	
No. 1 Charcoal, Cold-short and Neutral	18 50@19 50
No. 1 Stonecoal and Coke, Cold-short and Neutral	18 00@18 50
No. 2 " " " " " "	17 50@18 00
No. 1 Missouri and Indiana Red-short	21 00@22 00
White and Mottled, Cold-short and Neutral	15 00@16 00
CAR-WHEEL AND MALLEABLE IRON.	
Hanging Rock, and Cold Blast	34 00@38 00
Alabama and Georgia "	2[illegible] 00@23 00
Kentucky Cold-blast	25 00@33 00

Milwaukee, Wis. July 17, 1877.

Specially reported by Messrs. R. P. ELMORE & Co.

Wholesale Price.

Charcoal Iron.

No. 1 Lake Superior per gross ton	$25 00—4 mos.
No. 2 " " "	24 00—4 mos.

Anthracite Iron.

No. 1 anthracite per gross ton	$25 00—4 mos.
No. 2 " " "	24[illegible]—4 mos.

Stone Coal & Coke.

Wholesale Price.

Warner's Am. Sc'th (Bk. Bend) per ton	$25 00@ ....—4 mos.
Soft Silvery per ton	22 00@23 00—4 mos.
Lake Superior and Lake Champlain ores	24 00@25 00—4 mos.
Sharpsville (Penn.) native ores	24 00@25 00—4 mos.

Car Wheel.

Lake Superior ores per ton	$25 00@27 00—4 mos.

Montreal. July 10, 1877.

During the past week business has not improved, and the amount done has been small, prices remain nominally unchanged. Pig iron—Gartsherrie, $20 to $20.50; Summerlee, $19 to $19.50; Eglinton and Clyde, $18.50 to $19; Langloan $19.25 to $19.75; Coltness, $20.25 to $21; Hematite, $23 to $24; American, $20 to $21. Bars—Scotch and Staffordshire, $1.90 to $1.95; best do., $2.15 to $2.25; Swedes and Norway, $4.75 to $5; Lowmoor and Bowling, $6 to $6.50.—*Monetary Times.*

Philadelphia, Pa.

[Weekly Report of the Philadelphia Iron Market, furnished for THE ENGINEERING AND MINING JOURNAL, by JUSTICE COX, Jr., & Co., Iron Merchants, 333 Walnut Street, Philadelphia, Week ending July 19, 1877.]

PIG IRON.—The demand continues exceedingly slack. The mills and foundries do not start up, hence few sales of pig iron are reported. The market may be quoted dull and weak as to price. We report sales of about 600 tons at quotations. We quote No. 1, $18 to $19.50; No. 2, $17 to $18.50; Gray Forge, $16 to $18, as to brand and lots.

MANUFACTURED IRON.—The demand for manufactured iron is rather better than at our last, but yet it is anything but encouraging. The exceeding low prices now ruling make all feel that they must have better prices or stop. We quote: Bars, 2 to 2·2c. per lb.; Plate and Tank, 2·5 to 6·5c. per lb.; Skelp, 2·12 to 2·5c. per lb.

RAILS.—In steel the orders continue in a small way for repairs, etc., but nothing large or new has been reported this week. With iron, little is doing, some light sales are by order, but the general business is dull. We quote steel $45 to $50; iron, $33 to $36, all at mill.

OLD RAILS.—Nothing new is reported this week. Some orders taken to arrive are coming in. We quote $19.50 to $20.50.

SCRAP.—There has been quite a movement in steel scrap this week, one sale of 600 tons being reported, terms and price withheld for the present. Nothing doing in iron scrap. We quote, $14 to $19 for cast; $20 to $26 for wrought.

OLD WHEELS are quoted $18.50 to $20.

MUCK BARS are quoted, in the absence of business, $34 to $36.

Pittsburgh, Pa. July 17, 1877.

Specially reported by A. H. CHILDS.

Pig iron continues extremely dull, and while quotations remain nominally unchanged the market is weaker and the tendency towards lower prices.

	4 mos.		4 mos.
No. 1 F'dry	$22 00@24 00	Mottled & White	$18 00@19 00
" 2 "	20 00@22 00	Hot blast C'coal	22 00@28 00
Gray Forge	19 00@21 50	Cold " Western	40 00@45 00

Richmond, Va. July 16, 1877.

Specially reported by ASA SNYDER, Esq.

Virginia Cold Blast Charcoal Pig Iron, cold blast	$21 to $25
" " " " " " neutral	30 to 32
" Warm " " " "	24 to 28
" Anthracite 1 X	21 to 22
" " 2 X	20 to 21
" " 3	19 to 20
" " Coke Quinimont 1 X	23 to —
" " " " 2 X	22 to —

San Francisco, Cal.

From the *Commercial Herald* of July 12:

Stocks of pig iron and tin plate are excessive, while of assorted manufactured iron, etc., supplies are liberal, with but a moderate trade for the season. We quote Sydney pig tin at 18c. The *Buttermere* from Liverpool is to hand with 1,775 boxes tin plate, 450 tons pig iron, etc.

St. Louis, Mo. July 17, 1877.

Market very dull. Nothing new to report. We quote same as last.

Specially reported by Messrs. SPOONER & COLLINS, Commission Agents for all kinds of Iron.

COLD BLAST CHARCOAL—ALL NUMBERS

Hanging Rock	25@40	Assorted Bar Iron	$2 10, rates.
Tennessee	28@30	No. 1 Wrought Scrap	80c. cwt.
Kentucky	28@30	Heavy cast "	65 "
Missouri	28@30	Light "	35 "
Georgia	28@30	Old rails	18 50 to 19 00
Alabama	28@30	Old car wheels	18 00 to 19 00

	No. 1.	No. 2.	Mill.	White and Mottl'd.
Missouri stone coal	$23 00	$22 00	$21 00	.....
" charcoal	23 00	22 50	22 00	20 00
Tennessee charcoal	23 00	22 50	22 00	20 00
Tenn. coke very soft and strong	25 00	23 00	22 00	20 00
Hanging Rock charcoal	26 00	24 50	23 50	.....
" " cold short	25 00	24 00	.....	.....
	Ex No. 1	No. 1.	B No. 1.	No. 2.
Alice Hanging Rock coke	$25 50	$25 00	$24 50	$23 00
Quinnimount, W. Va., coke	25 00	24 00	23 50	22 50

METALS.

NEW YORK, FRIDAY EVENING, July 20, 1877.

The market has been very quiet for the week past, and prices are weaker in nearly every instance.

Gold Coin.—During the week under review the price of gold has ranged from 105⅝ to 105¼, and closing at 105⅝.

Bullion.—Silver has been up to 54½d. this week, but is down to 54d. to-day, doubtless owing to sales by the German government, as week before last they sold in London $1,500,000. Sterling Exchange has fallen off, during the past week, nearly one per cent., thus equalizing the advance per oz. for silver in London. This market will probably remain steady at about present figures. We quote 118 per oz., while San Francisco quotes at 9 per cent. discount. Gold bars are quoted at par to ¼ per cent. premium.

Daily Range of Silver in London and New York per oz.

Date.	London. Pence	New York. Cents	Date.	London. Pence	New York Cents
July 14	54⅛	118¾	July 18	54½	118½
" 16	54⅜	118⅝	" 19	54⅜	118¾
" 17	54⅜	118½	" 22	54	118

The Carson, Nevada, Mint Coinage, during the fiscal year ending June 30, 1877, was as under:

GOLD.	PIECES.	VALUE.
Double Eagles	84,385	$1,687,700
Half Eagles	6,887	34,435
Total gold	$91,272	$1,722,135
SILVER.		
Trade Dollars	221,000	$221,000
Half Dollars	2,544,000	1,272,000
Quarter Dollars	4,588,000	1,147,000
Dimes	9,160,000	916,000
Total Silver	16,513,000	$3,556,000
Total coinage	16,604,272	$5,278,135

Melters and Refiner's operations for the fiscal year ending June 30, 1877: standard gold bullion operated upon—ounces, 174,909 850-1.000, valued at $3,254,136 74. Standard silver bullion operated upon—ounces, 5,438,-431 80-100; valued at $6,766,322 80. Coiner's operations for the fiscal year ending June 30, 1877: Standard gold bullion operated upon—ounces, 177,919 317-1,000, valued at $3,310,126 83. Standard silver bullion operated upon—ounces, 6,018,254 91-100, valued at $7,487,720 17.

During the year fine silver bars valued at $659,609-28 have been manufactured at this Mint.

Copper.—The business in this article has probably been within 200,000 lbs., at about 19c. The market is now weaker, and quoted at 18¾c.@19c.

Messrs. Von Dadelszen & North, of London, under date of July 5, say: "Copper has been quiet. Chili bars, G.O.B., have been quoted about £69 through the month. Buyers generally have tried for a reduction, but it has rarely exceeded 5/ per ton. Bars, lying in Swansea, have realized an extra price, and picked brands have sold for £69 5/ to £70. The arrival of Chili was 2,329 tons, and the delivery 2,556 tons. The charters for first half of June were 1,200 bars, of which 50 tons were for the Continent. For the second half they were 1,600 tons, all for the United Kingdom (of which 700 tons in ore). In Australian the business has again been limited, owing to the uncertainty of the action likely to be taken by the Wallaroo Company. No public sale has been announced, and as the greater portion of the second-hand stock is entirely out of the market, very high prices have been realized for small lots required for immediate use. The last prices realized for Wallaroo Cake were £80.15s. and £81. Burra has sold for £75 to £75.10s. English has been steady, and tough quoted £74.10s. to £75.10s.; select, £76 to £77; sheets, £81. Ore realized from 13s. 6d. to 13s. 10½d. per unit, according to assay. The following are the stocks:

	June 1, 1877.	July 1, 1877.	July 1, 1876.	July 1, 1875.
	Tons.	Tons.	Tons.	Tons.
Stock, Liverpool & Swansea	15,527	15,300	12,489	14,312
" Havre	8,735	9,157	5,624	1,025
" London	4,700	5,147	5 702	7,798
Chili produce afloat and chartered by mail & cable	28,962 / 11,000	29,604 / 11,000	23 815 / 10,050	23,135 / 6,300
Total	39,962	40,604	33,865	29,435
Australian afloat	1,081	1,300	540	334

Tin.—Owing to large arrivals, and in the absence of any considerable business, the prices of pig tin are weaker. We note sales of 15 tons of English Refined at 16c., and 10 tons of L. & F. at 15⅝c. We quote, in gold, per lb. as follows: Straits, 15⅜c.@16c.; Refined, 16c.; L. & F., 15⅝c.; Banca, 18⅛c.@18⅜c. and Australian, 16c. Straits in London is quoted by cable at £67 10s.

Messrs. Von Dadelszen & North, of London, under date of July 5, say: "Tin has been very dull throughout the month. In straits the transactions reported have been but trifling, at between £68 and £69. Of Australian, a considerable quantity has been taken between £68.10s. and £67.10s., but mainly at £67.15s. and £67.10s. The continued large shipments of Australian have had a very depressing effect, and caused the realizatian of several parcels, held for a length of time, in hopes of an improvement which has not yet come. The shipments from the Straits continue small, but we cannot believe in any extensive curtailment of actual production, but rather in a holding back of supply. The condition of Cornwall is becoming more critical, and there are certain indications of financial pressure which may cause the forced stoppage of several mines, and, naturally with it, a sensible falling off in the production of tin. The arrivals of tin here during June were 728 tons, of which 286 were simply in transit to America, while the delivery was 968 tons, exclusive of the 286 tons to America. In Holland the delivery was, Banca 480, billiton 210 tons. The Dutch market has been quiet, at f.42½ to f.42⅝ for Banca, and f.41¼ to f.41½ for billiton. The sale of billiton, held in Batavia on the 10th ult., went at an average of f.45½ per picul, equal to f.41½ per 50 kilos laid down in Holland, or about £70 per ton. English tin has been in fair demand, and realized about £73 for ingots, and £74 for bars. The following are the statistics of foreign tin, here and in Holland, compared with the three preceding months, and the three preceding years,

	June 1, 1877.	July 1, 1877.	July 1, 1876.	July 1, 1875.
	Tons.	Tons.	Tons.	Tons.
Banca on Warrants, Holland	1,468	990	842	466
Billiton, do., do.	1,166	1 452	1,155	710
Australian, do., do.	720	720	—	—
Foreign tin in warehouse, London	9,522	8,996	7,041	6,127
Total available stock	12,876	12.158	9,038	7,303
Billiton afloat for Holland	900	960	1,030	1,000
Straits afloat for London	328	414	900	730
Australian afloat for London	2,558	3,308	1,100	900
Total afloat	3,876	4,702	3.030	2,630
Banca arrived for coming sales	214	806	1,836	2,718
Banca afloat per sailing vessels	575	456	390	940
Price of straits	£69	£69	£75	£82 10s.

Tin Plates.—A very liberal business is reported in cokes, while charcoals are very quiet. We quote in gold, per box as follows: Charcoal tins, $6.62½@$6.75, and ternes $6@$6.12½; coke tins, $5.80, and ternes, $5.37½@$5.62½.

Messrs. Robert Crooks & Co., of Liverpool, under date of July 6, say: "The past month has been a quiet one, so far as purchases have been concerned. Buyers have been doing only what was absolutely necessary for the purpose of sorting up stocks, feeling that the present range of prices was unsafe to buy largely at. Makers are generally still running on orders taken at the low prices recently current, and refuse new orders unless at an advance of 6d. to 1s. 6d. for charcoal tins; 6d. to 9d. per box for ternes: 6d. to 1s. on coke tins; and about 6d. per box on ternes. There are indications here and there that makers are getting desirous of adding to their order books, and unless the American market improves, we cannot see anything to prevent reductions on existing quotations. We would advise the sending of orders at limits, to be placed when opportunity offers."

Lead.—The market has broken under a sale of 50 tons of ordinary Western lead at 5¾c. It is said that there is more offering at the same price, while small lots are reported to have been sold at 5'45c.@5½c. The inquiry is exceedingly light as is usual during this month.

Spelter and Zinc.—Spelter is very quiet at 5¾c.@6c. Sheet zinc, without animation, is quoted at 7c.@7¼c.

Antimony.—In the absence of important transactions we quote this article at 11½c.@11⅝c., gold.

Quicksilver.—

The San Francisco *Commercial Herald* of July 12, says: "Spot supplies are falling short of the export requirements, causing a slight improvement in price. Some of the largest receivers are asking 45c., having none to sell, others sell at 42½@43c. for prompt cash. As before stated the *Oceanic* for Hongkong carried 1,832 flasks.

COAL TRANSPORTATION AND GENERAL MINING STOCKS.

Name and Location of Company.		Feet on Vein.	Capital Stock	Shares. No.	Shares. Par Val.	Assessments. Total levied to date.	Assessments. Date and amount per share of last. Mo.	Yr.	Amt.	Dividends. Total paid to date.	Last Dividend. Mo.	Yr.	Amt.	Rate per Ann.	Highest and Lowest Quo. per Share in Currency. July 14. H.	L.	July 16. H.	L.	July 17. H.	L.	July 18. H.	L.	July 19. H.	L.	July 20 H.	L.	Sales.
Coal Stocks.			$			$				$																	
Consol. Coal	Md.	....	10,250,000	102,500	$100	.....	.....	.....	.....	...	Jan.	1877	2½	10	....	....	....	....	....	....	....	....	....	....	....	....	....
Del. & H. Canal	Pa.	....	20,000,000	200,000	100	.....	.....	.....	.....	38,522,920	Aug.	1876	4	8	37⅛	35½	36¼	35	36¾	35	37	35	35¾	34¼	36½	35	26,144
Del., Lac. & W. RR.	Pa.	....	26,200,000	524,000	50	.....	.....	.....	.....	....	Apr.	1876	2½	10	41⅞	32¾	42⅞	39⅞	41⅛	39⅞	41	39¾	39½	38¾	40¾	39	193,785
Lehigh C. & N.	Pa.	....	10,448,550	208,971	50	.....	.....	.....	.....	....	Sep.	1876	1¾	6	18¾	18¾	18¾	18⅛	18⅛	18⅜	18¾	18¾	18⅝	18¾	18¾	18⅛	2,727
Lehigh Valley RR.	Pa.	....	27,042,900	540,858	50	.....	.....	.....	.....	....	Apr.	1877	1¾	6	35	34½	35	34⅜	35⅛	35	35⅜	35¼	35¼	35¼	35¼	35	3,420
Maryland Coal	Md.	....	4,600,000	44,000	100	.....	.....	.....	.....	...	Jan.	1876	1½	11½	....	....	....	....	....	....	....	....	....	....	....	....	....
N. J. Central RR.	Pa.	....	20,600,000	206,000	100	.....	.....	.....	.....	....	Apr.	1876	2½	10	9⅞	9½	9⅝	9¼	9⅝	9⅜	10	9⅝	10⅛	9⅞	11½	10¼	3,822
Penna. Coal	Pa.	....	5,000,000	100,000	50	.....	.....	.....	.....	....	Feb.	1877	5	20	....	....	....	....	....	....	....	....	....	....	....	....	....
Pennsylvania RR.	Pa.	....	68,868,700	1,377,376	50	.....	.....	.....	.....	....	Feb.	1877	2	8	32⅝	31¾	32	32¼	32¾	32⅛	32⅞	32⅛	32⅜	32	31½	31⅜	89,073
Phil. & Read. RR.	Pa.	....	34,278,755	685,575	50	.....	.....	.....	.....	....	Jan.	1876	2½	10	12¼	12¼	12½	12¼	12½	12¼	12⅝	12⅞	12⅜	12⅛	12¼	12⅛	2,376
General Mining Stocks																											
Alpha Cons. G. S.	Nev.	300	3,000,000	30,000	100	180,000	Aug.	1875	$1 00	....	.....	.....	.....	..	....	....	....	....	....	....	11¼	11	....	....	....	....	300
Am. Flag, G.	Colo.	5,300	600,000	60,000	10	**	....	....	....	....	....	....	....	..	10c	8c	10c	..	11c	9c	11c	10c	12c	10c	9c	..	8,400
Belcher. G. S.	Nev.	1 040	10,400,000	104,000	100	968,400	July	1877	1 00	15,397,200	Apr.	1876	$1 00	12	4⅛	4	.	..	3¾	3⅝	4	3⅞	..	..	..	..	700
Bertha, G.	Vir.	645 acs.	300,000	30,000	10	**	....	....	....	....	....	....	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Best and Belcher, G. S.	Nev.	545	10,080,000	100,800	100	236,992	Feb.	1877	1 00	....	....	....	....	..	19⅞	19½	....	....	....	....	15¾	15½	15½	..	..	..	450
Bobtail, G.	Colo.	2,500	1 736,630	227,326	5	**	....	....	....	....	....	....	....	..	1½	1.45	1½	1.45	1½	..	1.55	1½	1½	..	..	..	3,050
Bobtail Tunnel, G.	Colo.	943½	100,000	20,000	5	6,000	July	1873	0 30	20,000	Dec.	1876	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Bullion, G. S.	Nev.	2,188	10,000,000	100,000	100	2,552,000	June	1877	1 50	....	....	....	....	..	....	....	6¼	..	....	....	5⅝	5¾	..	..	5¼	5⅛	900
Caledonia, G. S.	Nev.	600	10,000,000	100,000	100	1,360,000	June	1877	50	....	....	....	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....	....
California, G. S.	Nev.	1,400	54,000,000	540,000	100	....	....	....	....	6,200,000	June	1877	2 00	24	37	..	36⅛	36	†31	..	31	..	31	30⅞	31	29¾	1,800
Chollar Potosi, G. S.	Nev.	3,715	2,800,000	28,000	100	1,338,000	May.	1877	2 00	3,080,000	Feb.	1872	1 00	12	33	..	31⅛	31	29¾	29¼	..	..	..	..	..	..	800
Cleveland, G.	Colo.	16,500	250,000	25,000	10	**	....	....	....	....	....	....	....	.	9	8⅞	8⅞	..	9	..	9⅛	8¾	8½	8	8⅛	7¾	3,100
Cons. Hercules & Roe.	Colo.	468	1,000,000	100,000	10	**	....	....	....	120,000	.....	....	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Cons. Imperial, G. S.	Nev.	15,000	50,000,000	500,000	100	475,000	May.	1877	0 20	....	....	....	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Con. N. Slope & E. C. T.	Colo.	710	500,000	10,000	50	**	....	....	....	....	....	....	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Cons. Virginia, G. S.	Nev.	130	54,000,000	540,000	100	474,600	June	1873	3 00	30,240,000	June	1877	2 00	24	....	....	....	....	....	....	3½	....	....	....	....	....	100
Confidence, G. S.	Nev.	600	2,496,000	24,960	100	243,840	Mar.	1873	1 00	78,000	May.	1865	8 ⅓	..	....	....	....	....	4¾	....	....	....	....	....	....	....	100
Crown Point, G. S.	Nev.	21,000	10,000,000	100,000	100	1,473,370	June	1877	1 00	11,588,000	Jan.	1875	2 00	24	....	....	3⅞	3¾	3¼	....	....	....	3⅜	3¼	3	2¾	900
Douglas	Colo.	..	1,000,000	10,000	100	**	....	....	....	....	....	....	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Eureka Cons. G. S. L.	Nev.	..	5,000,000	50,000	100	100,000	May	1876	1 00	1,000,000	Aug.	1875	1 00	..	28⅞	28⅝	29⅝	29½	30⅛	30	29½	29	..	..	..	..	800
Eureka G. Mg. G.	Cal'f	400	2,000,000	20,000	100	....	....	....	....	2,094,000	May.	1877	2 00	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Exchequer, G. S.	Nev.	621	10,000,000	100,000	100	280,000	Sept.	1876	1 00	....	....	....	....	..	....	....	....	....	6¾	....	6⅜	....	6⅜	....	6⅛	6⅛	1,300
Gould and Curry, G. S.	Nev.	9,000	10,800,000	108,000	100	2,242,000	Apr.	1877	1 00	3,934,800	Oct.	1870	10 00	..	13¾	13½	13	12⅞	..	..	10½	10⅛	10½	10	10	9¾	1,600
Granville Gold	N. C.	400	1,000,000	100,000	10	**	....	....	0 50	....	....	....	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Hale & Norcross, G. S.	Nev.	3,000	11,200,000	112,000	100	2,410,000	Apr.	1877	.....	1,598,000	Apr.	1871	1 00	12	6¼	..	5⅜	5⅛	5	..	5⅛	5	..	..	4	..	1,610
Henry Tunnel	Nev.	3,288	2,000,000	80,000	25	**	....	....	....	....	....	....	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Hukill, G. S.	Colo.	1,000	1,000,000	100,000	10	**	....	....	....	40,000	May.	1877	0 10	12	....	....	....	....	....	....	3½	....	....	....	....	....	100
Indian Queen, S.	Nev.	3,000	3,000,000	60,000	50	....	....	....	....	60,000	Dec.	1875	0 50	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Julia Cons., G. S.	Nev.	2,100	11,000,000	110,000	100	330,000	Apr.	1877	1 00	....	....	....	....	..	....	....	....	....	....	....	2	1¾	2	1⅞	2	..	700
Justice, G. S.	Nev.	95	10,500,000	105,000	100	1,060,000	June	1877	1 50	....	....	....	....	..	....	....	8½	..	8⅛	..	8	..	8	7⅞	..	..	405
Kentuck, G. S.	Nev.	2,700	3,000,000	30,000	100	270,000	Dec.	1874	1 00	1,252,000	Mar.	1870	5 00	..	....	....	....	....	3½	....	....	....	....	....	....	....	200
Kossuth, G. S.	Nev.	3,900	5,400,000	108,000	50	405,000	Aug.	1876	0 50	....	....	....	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Lacross	Colo.	1,500	1,000,000	100,000	10	**	....	....	....	....	....	....	....	..	37c	35c	35c	34c	37c	35c	37c	36c	40c	38c	..	1⅜	11,100
Leopard, L. G. S.	Nev.	4,200	5,000,000	50,000	100	75,000	Mar.	1876	1 00	162,500	Dec.	1876	0 50	..	1½	1⅜	1¼	..	1¼	1⅛	1½	1¼	1⅜	1¼	1½	..	3,600
Lucerne Mining	Colo.	44-387	5,000,000	500,000	10	**	....	....	....	....	....	....	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Mariposa, preferred	Cal.	acres.	5,000,000	50,000	100	1,425,000	June	1877	1 00	....	....	....	....	..	2¼	..	....	..	2½	..	....	..	2⅛	2¼	..	..	700
" common	"	6,000	10,000,000	100,000	100	1,425,000	June	1877	1 00	....	....	....	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Memphis	Colo.	1,500	500,000	60,000	8⅓	**	....	....	....	....	....	....	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Merrimac, S.	Mass.	600	500,000	50,000	10	**	....	....	....	65,000	June	1877	40c	12	....	....	6½	..	6⅝	6½	....	....	....	....	....	....	500
Mexican, G. S.	Nev.	39,000	10,080,000	100,800	100	151,200	June	1877	0 40	....	....	....	....	..	11⅞	11¾	....	....	11	....	....	....	....	....	....	....	218
Moose	Colo.	....	2,000,000	200,000	10	....	....	....	....	....	....	....	....	..	4¼	..	4⅜	4¼	4½	4⅛	4½	4¼	4⅜	4¼	4⅛	4¼	13,400
N. Y. & Colo., G.	Colo.	1,600	1,000,000	50,000	20	....	....	....	....	20,000	Mar.	1877	0 20	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Northern Belle, S.	Nev.	3,000	5,000,000	50,000	100	....	....	....	....	1,250,000	June	1877	1 00	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Ontario	Utah	675	10,000,000	100,000	100	....	....	....	....	350,000	July	1877	50	6	....	....	....	....	21⅛	21	21⅛	....	....	....	....	....	770
Ophir, G. S.	Nev.	....	10,080,000	100,800	100	2,934,400	May.	1875	2 00	1,394,400	Mar.	1874	4 00	..	17⅝	17⅛	17	16¾	....	....	....	....	15	15¾	....	....	900
Original Comstock, G. S.	Nev.	1,200	10,000,000	10,000	100	....	....	....	....	....	....	....	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Overman, G. S.	Nev.	1,200	3,840,000	38,400	100	2,452,680	June	1877	3 00	....	....	....	....	..	....	....	15⅜	15	14⅜	....	12⅛	12	....	....	11¼	....	800
Pleasant View, G.	Colo	8,500	200,000	20,000	10	**	....	....	....	....	....	....	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Quicksil. preferred	Cal.	acres.	4,291,300			**	....	....	....	....	....	....	....	..	....	....	....	....	....	....	....	....	23¾	....	....	....	100
" common	"	5,000	5,708,700	100,000	100	....	....	....	....	....	....	....	....	..	....	....	....	....	....	....	....	....	....	....	....	1¾	....
Raymond and Ely, G. S.	Nev.	2600 acs.	3,000,000	30,000	100	540,000	Dec.	1876	1 00	3,075,000	Sept.	1873	3 00	..	8⅛	..	9¼	9⅜	9½	9⅜	10¾	10½	..	..	16	1	1,000
St. Joseph, L.	Mo.	2,000	1,000,000	100,000	10	....	....	....	....	250,000	....	....	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Santiago, G. S.	Nev.	800	11,200,000	112,000	100	....	....	....	....	....	....	....	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Savage, G. S.	Nev.	1,700	11,200,000	112,000	100	3,194,500	May.	1877	1 00	4,460,000	June	1869	3 00	..	....	....	....	....	....	....	....	....	....	....	6¼	....	100
Seaton, G. S.	Colo.	160	500,000	50,000	10	**	....	....	....	10,000	May.	1877	0 10	12	....	....	1¼	1	....	....	....	....	1	....	1	....	1,100
Seg. Belcher. G. S.	Nev.	3,650	640,000	6,400	100	244,800	Apr.	1876	5 00	....	....	....	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Sierra Nevada G. S.	Nev.	3,900	10,000,000	100,000	100	1,700,000	June	1877	0 50	....	Jan.	1871	1 00	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Silver City, G. S.	Nev.	5,400	6,310,000	63,100	100	15,775	Nev.	1876	0 25	....	....	....	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Silver Hill, G. S.	Nev.	1,500	5,400,000	54,000	100	918,000	Apr.	1877	1 00	....	....	....	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....
South Comstock, G. S.	Nev.	1,500	10,000,000	100,000	100	54,000	Jan	1877	0 25	....	....	....	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....
South. California, G. S.	Nev.	1,500	5,000,000	50,000	100	....	....	....	....	....	....	....	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Southern Star. G. S.	Nev.	..	6,000,000	600,000	100	....	....	....	....	....	....	....	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Trenton, G. S.	Nev.	850	10,000,000	100,000	100	....	....	....	....	....	....	....	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Union Cons., G. S.	Nev.	1,000	10,000,000	100,000	100	260,000	Mar.	1876	1 00	....	....	....	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....
West Belcher, G. S.	Nev.	1,200	10,000,000	100,000	100	....	....	....	....	....	....	....	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Yellow Jacket, G. S.	Nev.	1,000	12,000,000	120,000	100	2,838,000	Mar.	1877	1 00	2,184,000	Aug.	1871	2 50	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Young America, S.	Nev.	....	3,200,000	30,000	100	6,000	Oct.	1876	0 20	....	....	....	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Boston Stocks.																											
Allouez, C.	Mich.	..	1,000,000	20,000	50	940,000	May.	1876	5 00	....	....	....	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Calumet & Hecla, C.	Mich.	..	2,000,000	80,000	25	1,200,000	....	....	....	11,450,000	Feb.	1877	5 00	20	....	....	....	....	....	....	....	....	....	....	....	....	....
Central, C.	Mich.	..	500,000	20,000	25	100,000	June	1862	0 65	1,160,000	Feb.	1877	7 00	28	....	....	....	....	....	....	....	....	....	....	....	....	....
Copper Falls, C.	Mich.	..	1,000,000	20,000	50	535,000	May.	1876	....	100,000	Nov.	1871	1 00	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Dana, C.	Mich.	..	500,000	20,000	25	68,000	Jan.	1863	0 50	....	....	....	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Dawson, S.	Ont.	..	1,200,000	60,000	20	....	....	....	....	....	....	....	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Duncan, S.	Ont.	..	1,200,000	60,000	20	75,000	July.	1876	41⅔	....	....	....	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Franklin, C.	Mich.	..	500,000	20,000	25	360,000	June	1876	5 00	585,000	Nov.	1871	1 00	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Humboldt, C.	Mich.	..	500,000	20,000	25	100,000	Sept.	1876	0 15	....	....	....	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....
International, S.	Ont.	..	1,200,000	60,000	20	....	....	....	....	....	....	....	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Madison, C.	Mich.	..	500,000	20,000	25	123,000	Sept.	1876	0 10	....	....	....	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Mesnard, C.	Mich.	..	500,000	20,000	25	160,000	Apr.	1876	0 50	....	....	....	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Minnesota, C.	Mich.	..	1,000,000	20,000	50	436,000	June	1876	1 00	1,820,000	Mar.	1876	0 50	..	....	....	....	....	....	....	....	....	....	....	....	....	....
National, C.	Mich.	..	500,000	20,000	25	195,000	Oct.	1875	1 00	360,000	Oct.	1873	1 00	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Osceola, C.	Mich.	..	1,000,000	40,000	25	880,000	May.	1876	2 00	....	....	....	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Petherick, C.	Mich.	..	500,000	20,000	25	165,533	Mar.	1876	0 50	....	....	....	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Pewabic, C.	Mich.	..	500,000	20,000	25	185,000	June	1868	3 00	460,000	July	1873	1 00	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Phœnix, C.	Mich.	..	1,000,000	20,000	50	817,500	Sept.	1870	3 00	20,000	Jan.	1876	1 00	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Quincy, C.	Mich.	..	200,000	20,000	10	....	....	....	....	2,130,000	Feb.	1877	4 00	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Ridge, C.	Mich.	..	500,000	20,000	25	200,000	....	....	....	90,000	Feb.	1875	1 00	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Rockland, C.	Mich.	..	500,000	20,000	25	495,000	Jan.	1874	) 00	....	....	....	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Star, C.	Mich.	..	500,000	20,000	25	265,000	Mar.	1876	0 50	....	....	....	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....
Superior, C.	Mich.	..	500,000	20,000	25	340,000	Mar.	1874	0 25	....	....	....	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....

G. Gold. S. Silver. L. Lead. C. Copper. ** Non-Assessable. † Ex Dividend.

Total Assessments levied to date ..... $42,830,530 | Total Sales of Coal Stocks for the week ..... 321,347 share
Total Mining Dividends disbursed to date ..... 118,097,900 | Total Sales of Mining Shares for the week ..... 61,603 "

Salt Lake Ore and Metal Market.

SALT LAKE CITY, UTAH, July 20, 1877.

Argentiferous Lead (Base Bullion).—$60 to $65 per ton for lead. $1.18½ per ounce for silver. $20 per ounce for gold. The quotations for silver are based upon the silver contents in the lead of 70 ounces per ton of 2,000 lb.

The *Inter-Ocean's* correspondent, under date of the 11th inst., says: "The market in bullion is flat, with out any sales to report. There is considerable going forward, but it is on consignment.

"The shipments of ore and bullion from Salt Lake City for the week ending July 7 were as follows: 17 cars bullion to Pittsburg, 12 cars bullion to Omaha, 4 cars bullion to New York, 15 cars bullion to Philadelphia, 15 cars bullion to Newark; 10 cars lead ore to Pittsburg, 5 cars lead ore to Hilliard. Bullion, 1,280,044 lb.; lead, 208,180 lb. Total, 1,488,224 lb.

"Mr. Hunter, the late manager of the Flagstaff, has got possession of the South Star and Titus Mine, and is maintaining it with force. This will result, without doubt, in a lawsuit, involving the title of the Flagstaff to ground from which they are now taking their great production of ore."

FINANCIAL.

New York Stocks.

NEW YORK, Friday evening, July 20, 1877.

The week under review has been quite uneventful for the coal stocks on this market. Although strong efforts have been made to sell and hold prices, yet there has been a steady weakening. To the uninitiated, there may be features in the coal trade that would give them the impression that the value of these stocks is greater than it was a few weeks ago; but those who have an inner view of the doings and prospects of the companies, are inclined to think the reverse. Delaware, Lackawanna & Western R. R. has ranged from 42⅝ to 38¼ and closed at 39⅝, with sales for the week of 193,785 shares. The aggregate business in Delaware & Hudson Canal has been 26,144 shares at 37¼ to 34¼, and closing at 35⅝.

New Jersey Central Railroad stock has sold to the extent of of 3,822 shares, 11⅛ and 9⅛ being the extreme prices of this week, closing at 10¼ per cent. The receiver of this company appointed a commission to examine and appraise its real estate not used for the purposes of the road. The company owns a great deal of real estate on the line, acquired in different ways and for purposes, much of it with a view to selling again; some of this should be valuable, but a good deal is probably worth but little at the present time.

The Swartsville Cannel Coal Company will hold its annual meeting on the 27th inst.

Philadelphia Stocks.

PHILADELPHIA, FRIDAY EVENING, July 20, 1877.

The coal stocks in this market have been remarkably steady and quiet, with the exception of Pennsylvania R. R., which was steady until yesterday, having broken to-day in anticipation of serious trouble from its employees. The total sales in this stock for the week have been 89,073 shares, final sales having been 31⅝@31⅛.

Big Sandy Oil Company.—2 shares of this stock were sold at auction during the week at $1 per share.

Westmoreland Coal Company.—80 shares of the stock of this company were sold at auction during the week at $74 per share.

The Diamond Coal Company announces a dividend of 75c. per share, payable on demand.

The North Pennsylvania Railroad Company announces a dividend of three per cent., payable in scrip, bearing no interest, and convertible into the capital stock of the company when presented in sums of $50. The scrip so issued will be deliverable on the 25th of August, and convertible any time thereafter. The transfer books of the company close August 1, and the dividends will be credited to the stockholders as they may stand registered on that day.

Miscellaneous Sales and Quotations.

Sales and quotations of the stocks and bonds dealt in het and at Philadelphia, for the week ending the 20th inst. as given in the following tables. The Philadelphia quotatio will have a * affixed.

STOCKS.

	Quotations.—High-est.	Low-est.	Clos-ing.	Sales Shares
American Coal Co	—	—	25	—
*Cambria Iron Co	—	—	55	10
*Pennsylvania Salt Manf'g Co.	—	—	64	—
*Westmoreland Coal Co	—	—	55	—
*Buck Mountain Coal Co	—	—	40	—
*Schuylkill Nav. Co	—	—	—	—
St. Louis, I. M. & S. RR. Co	9½	7¼	8	800
Spring Mountain Coal Co	—	—	30	—

BONDS.

D., L. & W. 7s, Convt.,	1892	J. & D.	—	—	100½	—
" " 2d mtge.,	1881	M. & S.	—	—	107	—
N. J. C., 1st mtge., new		F. & A.	114⅞	113¾	114¾	$39,000
" " 1st mt., cons.	1899	Q.	63¾	62½	63	9,000
" " Convt		M. & N.	61¾	58¾	61	33,000
L. & W. B. Coal Co., cons.		Q.	25	24	25¾	16,000
Am. Dock & Imp. 7s		J. & J.	42	40½	—	6,000
D. & H. C. Co., 1st m.,	1884	J. & J.	—	—	91	—
" " " " "	1891	J. & J.	91	—	89	3,000
" " " "	1877	J. & J.	—	—	99	—
" " " " reg.,	1894	A. & O.	91	—	91	12,000
" " " " coup.,	1894	A. & O.	—	—	91	—
St. L. I. M. & S., 1st mt.	1892	F. & A.	103½	103⅜	103½	7,000
Ches. & Ohio, 1st mt.,	1899		—	—	22	—
*L. V. RR., con. m. 6s,	1923	J. & D.	—	—	91	
" " 2d m., 7s,	1910	M. & S.	112¼	112¼	112	5,000
" " reg.,	1898	J. & D.	—	—	109	—
" " coup.,	1898	J. & D.	109¼	108½	109	3,000
*P. RR., 1st mtge.,	1880	J. & J.	105¾	105½	105½	3,000
" Gen. mtge. reg.,	1910	A. & O.	108	—	107½	6,000
" Con. m. 6s. con.,	1905	J. & D.	92½	—	92½	1,000
" " " reg.	1905	Q.	93	92½	—	6,000
" gen. M. Coup.,	191c	J. & J.	106	105¾	105½	4,000
" New Loan 5s			—	109¼	108	— 25,000
*P. & R. RR., 7s,	1893	A. & O.	108	—	108	1,000
" " con. m. 7s. con.	1911	J. & D.	—	—	95	—
" " Deb. 6s,	1893	J. & J.	—	—	38	—
" " New convt. 7s.	1893	J. & J.	—	—	40	—
" " Con. mtge. 7s. reg.		J. & D.	93⅝	—	94	1,000
" " 6s. 1844-8c		J. & D.	103½	102½	103	2,500
*P. & R. C. & I. Co. Deb. 7s		M. & S.	—	—	50	—
*P. & R. C. & I. Co			—	—	—	—
*L. C. & N. Co. 6s.	1884	M. & Q.	102	—	102	660
" " RR. loan	1897	F. & Q.	102½	—	102½	100
" " Con. mtge. 7s.		J. & D.	—	—	—	—
" " Cvt. gold,	1894	M. & S.	—	—	99	—
" " Gold Loan,	1897	J. & D.	88	87	87	4,500
*Schuylkill Nav., 6s.	1897	M. & Q.	—	—	—	—
*Pa. and N. Y. Canal, 7s		J. & D.	109	—	109	2,000
*Pa. Canal Co		J. & J.	—	—	88	—
*Susquehanna Coal Co. 6s.			—	74	—	— 11,000

Total transactions for the week $200,760

Copper Stocks.

Reported by Wilson W. Fay & Co., Bankers and Brokers Room 7, Traveler Building, 31 State Street.

BOSTON, THURSDAY EVENING, July 19, 1877.

The market closes this evening with little activity, but much stronger than it has been lately, most of the stocks showing a tendency to advance more or less.

Calumet & Hecla looks very firm, it having advanced from 170 to 174 bid and 175 asked, there being sales at 170¼, 170⅛, 172, 173, and 175, the last being sold at 175.

Allouez, contrary to the general advance, has declined to $5.00 asked, there being no bid for it. Central still holds out at 38⅛c. bid and none offering. Copper Falls has advanced to $3.50 bid and $3.62 asked, and looks strong; favorable reports are heard from the mine nearly every day, which strengthen the stock. Franklin is quiet at $5.50 bid and $7.00 asked. Osceola, Pewabic and Ridge remain steady at $19.00 bid and $20.00 asked. $1.50 bid and $1.75 asked and $2.50 bid and $2.75 asked, respectively. Duncan has not fallen off a great deal, considering the assessment of $1 per share which has been levied on stockholders of record July 25, 1877, payable August 15, 1877, but is firm at $1.00 bid and $1.25 asked. International stronger at 30c. bid and 35c. asked, there being few sales in it. Generally the market is in better condition than it has been for some weeks.

Gold and Silver Stocks.

NEW YORK, FRIDAY EVENING, July 20, 1877.

The long-looked for consolidation of the two mining boards was accomplished to-day, and business in the stocks of the two boards was transacted in the room heretofore occupied by the American Mining and Stock Exchange. The following officers were elected for the new organization: President, Geo. B. Satterlee; Vice-President. C. M. Stead; Treasurer, Jno. Stanton, Jr.; Secretary, J. Wyman Morris; Chairman of Governing Committee, Geo. Tuthill; Chairman of Financial Committee, R. H. Rickard; Chairman of Arbitration Committee, E. S. Munroe; Chairman of Membership Committee, W. T. Whiting; Chairman of Securities Committee, W. A. Shepard. The New York Mining and Stock Exchange was the style adopted by the new organization. It is now anticipated and hoped that more interest will be shown, and a better business be done in mining stocks. The united boards will give their entire attention io mining stocks, and abandon the unprofitable effort to handle railroad and other securities. This movement will bring about a much better feeling between the New York Stock Exchange and the new Mining Exchange, and greatly help the cause of the latter.

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The business at the American Mining Board for the week has been 37,483 shares, and at the New York Mining and Stock Exchange, 25,010 shares. Moose has had a business of 13,400 shares at steady prices, and Lacrosse 11,100 shares. Outside of these two stocks there has been no business worthy of note.

The Belcher Mining Company has levied another assessment of $1 per share delinquent on the 11th of August.

United States Gold and Silver Amalgamating Company.—7 shares of the stock of this company were sold at auction in Philadelphia during the week at $50 per share.

June Dividends.—The following list comprises those mining companies who disbursed dividends in San Francisco during the month of June last:

Con. Amador Gold Mining Co.....	$ 25	per share..	$7,500
California Mining Co.....	2 00	" ..	1,080,000
Con. Virginia Mining Co.....	2 00	" ..	1,080,000
Empire (Sierra Co.) Gold Mining Co.	1 00	" ..	10,000
Hite(Grass Val.Cal.)Gold Mining Co.	20	" ..	20,000
Idaho Gold Mining Co.....	7 50	" ..	23,220
Northern Belle Silver Mining Co...	1 50	" ..	50,000
Ontario Silver Mining Co.....	50	" ..	50,000

A significant commentary on the condition of the money market in San Francisco is afforded by the offer of the Bank of Nevada to take $20,000,000 of the new 4 per cent. consols, if a reduction of ⅛ was given in lieu of the 1-16 offered. This was rejected. On the 16th inst. the bank repeated its offer, adding a guarantee to keep the bonds locked up for six months. The syndicate held a meeting on the same day, and refused to accept this also.

The *Bulletin* of the 19th inst., in an editorial on the subject, says: "The Nevada Bank and its friends, had the loan been offered for popular subscription, stood ready to set its name at the head of the list for $100,000,000. It may be added that the $20,000,000 subscription proposed to the syndicate was intended as a permanent investment, and the Nevada Bank offered to agree not to resell the bonds within the term covered by the syndicate's contract."

Mr. Fry, the President of the Bank of New York and the representative of the Nevada Bank in this city, in an interview with a reporter of the *Evening Post* today, disclaims all knowledge of the above statement that the Nevada Bank and its friends, had the entire loan been offered for popular subscription, stood ready to set its name at the head of the list for $100,000,000.

The *Commercial Herald* of the 12th inst. says: "Money continues abundant in our banking institutions, and is ready to be employed in legitimate fields of investment at more satisfactory rates to the borrower than ruled a year ago. Its movement is at present quite sluggish, on account of the inactivity in business circles; however, when the state of trade in our midst is compared with other large business centres, we ought not to complain. The rates in banks of discount rule from 10 to 12 per cent., and in savings banks from 8 to 10 per cent. per annum.

"The mining stock market does not seem to gain strength from any quarter at the present time, and a general flatness prevails throughout the list. Owing to the stagnation of business generally, Arizona is neglected from this side of the Continent; however, good properties are sought after, and when found, foreign capital is ready to pick them up, with a view of immediate development."

NEW YORK MINING STOCK EXCHANGE.—The sales amount to 25,010 shares, as against 21,150 shares reported in our last.

Sales—Copper Stocks.

Atlantic.....	2,400 shares	$7 00	@	$6 62½
Calumet Hecla	100 "		@	171 00
Central.....	260 "	40 00	@	39 75
National.....	200 "		@	25

Gas Stocks.

NEW YORK, FRIDAY EVENING, July 20, 1877.

A considerable improvement has occurred in many of the quotations of gas stocks, notably that of the Manhattan Company, which has advanced $5 per share.

Northern Liberties Gas Company, Philadelphia.—We note sales of 3 shares of the stock of this company at auction during the week, at $42 per share.

The Brookline (Mass.) Gas Company has declared a dividend of three per cent.

The Allen Gas Works at Allentown, Pa., are to be sold by the Sheriff. It is reported the city will make an effort to buy them. $17,500 of the 7 per cent. coupon bonds of this company were sold at auction in Philadelphia during the week at from 16 to 17½ per cent.

New York Gas Company.—20 shares of the stock of this company were sold at auction on the 16th inst. at $128 per share.

The San Francisco Gas Company has declared its regular monthly dividend of three-quarter per cent., equal to a disbursement of $15,000.

Companies in New York and vicinity.	Capital Stock.	Par.	Dividends. Rate per an.	Am. of last.	Date of last.	Quotat'ns Bid.	As'd
	$						
Mutual, N. Y.....	5,000,000	$100	10%	2½	July '77	*90	94
" Gold Bonds	90,000	1,000	7%	3½	Feb. '77		107
N. York "	4,000,000	....	10%	5	May '77	125	130
Metrop. "	2,500,000	100	10%	5	June '77	133	137
" " Certf.	1,000,000	....	7%	3½	" "	100	103
" " Bonds	500,000	1,000	7%	3½	" "	102	—
Harlem "	1,850,000	50	8%	4	July '77	98	102
Manhat. "	4,000,000	50	....‡	5	July '77	195	200
Brooklyn, B'klyn.	2,000,000	52	15%	5	July '77	150	160
Nassau, " ...	1,000,000	25	....‡	4	July '77	—	80
" " Certf.	700,000	1,000	7%	3½	July '77	95	100
People's, " ...	1,000,000	10	....‡	3½	July '76	—	40
" " Certf.	300,000	1,000	7%	3½	July '77	80	85
" " B'ds	325,000	....	7%	3	Feb. '77	90	96
Metrop. "	1,000,000	10	5%	2½	May '77	65	70
Wmsb'rg "	1,000,000	50	10%	3	Apr. '77	115	122½
" " Certf.	1,000,000	....	7%	3½	July '77	100	102
Citizen's "	1,200,000	20	....‡	4	Jan. '77	75	80
" " Certf.	320,000	1,000	7%	3½	Apr. '77	97	100
J. C., N. J.....	750,000	20	10%	5	July '77	160	—
Cent. Westch. N.Y	466,000	50	7%	4	July '77	85	90
Subur'n " "	295,000	50	7%	3½	Apr. '77	90	100
Municipal, N.Y..	1,500,000	100	.....	.....	.....	..	90

‡Paid irregularly. * Ex-Dividend.

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146th Auction Sale.
110,000 TONS SCRANTON COAL.
On WEDNESDAY, July 25th, 1877.

NEW YORK, July 18, 1877.

THE DELAWARE, LACKAWANNA AND WESTERN RAILROAD CO. will sell, by Messrs. JOHN H. DRAPER & CO., Auctioneers, at the Company's Salesroom, 26 Exchange Place, corner of William Street, New York, on Wednesday, July 25, at twelve o'Clock, Noon,

110,000 TONS OF COAL,

from the Lackawanna Regions, of the usual sizes, deliverable at Hoboken, during the month of August, 1877.

The sale will be positive; each lot put up will be sold to the highest bidder.

No Bids, in any form whatever, being made for account of, or on behalf of the Company.

The conditions will be fully made known at the time of sale.

TERMS—FIFTY CENTS PER TON, payable in current funds, on the day of Sale, and the balance within ten days thereafter, at the office of the Company.

SAMUEL SLOAN, President.

OFFICE PENNSYLVANIA COAL COMPANY
TRINITY BUILDING, 111 BROADWAY,
NEW YORK, JULY 19, 1877.

The Pennsylvania Coal Co.

WILL SELL, AT PUBLIC AUCTION,

By Messrs. JOHN H. DRAPER & CO., AUCTIONEERS,

AT EXCHANGE SALESROOMS,

(Basement of Trinity Building),

111 BROADWAY, NEW YORK,

On WEDNESDAY, the 25th day of July, inst.,

AT ELEVEN O'CLOCK, A. M.,

90,000 TONS
PITTSTON COAL,

of the usual sizes, deliverable at Company's Docks at Newburg, during the month of August, 1877.

The terms and conditions of this sale will be read at the sale.

Delivery will be made, if desired, in Company's boats, at New York or Brooklyn, at a charge of Sixty Cents per Ton additional to the sale price.

GEO. A. HOYT,
VICE-PRESIDENT.

VALUABLE
MINING PROPERTY
FOR SALE.

In the matter of the West Canada Mining Company, Limited (in liquidation).

The Liquidator invites tenders for the purchase of the property of the above Company, as situated in the District of Algoma, Province of Ontario, in the Dominion of Canada. The property consists of:

1. The freehold of the Bruce Location, measuring 6,400 acres, and comprising the Bruce and Wellington Mines.

2. All the right of the said Company in the unexpired term of a lease of the Huron Copper Bay Mine, for a term of 15 years from the 1st day of May, 1874.

3. The buildings belonging to the said Company at the said Mines and locations, comprising Engine and Boiler Houses, Jigging and Dressing Houses and Sheds, Furnace Houses and Stacks, two agents' and clerks' offices, Blacksmiths' and Carpenters' Shops, Storehouse, and a number of good dwelling houses and ordinary cottages. Also a Wharf at the Wellington Mine, about 1,150 feet in length, and Warehouse, affording every convenience for the loading of ships.

4. All the Machinery and Stores belonging to the said Company, consisting of Hoisting and Pumping Engines, Crushing and Jigging Machinery, Calcining Furnaces, Iron, Timber, Tools, etc.

The property mentioned in clauses 3 and 4 is subject so far as regards any portions of it which are situated on the Huron Copper Bay Location, to the option reserved to the Lessors, on the termination of the said Lease, of taking to any portion of the Machinery and Buildings at a valuation.

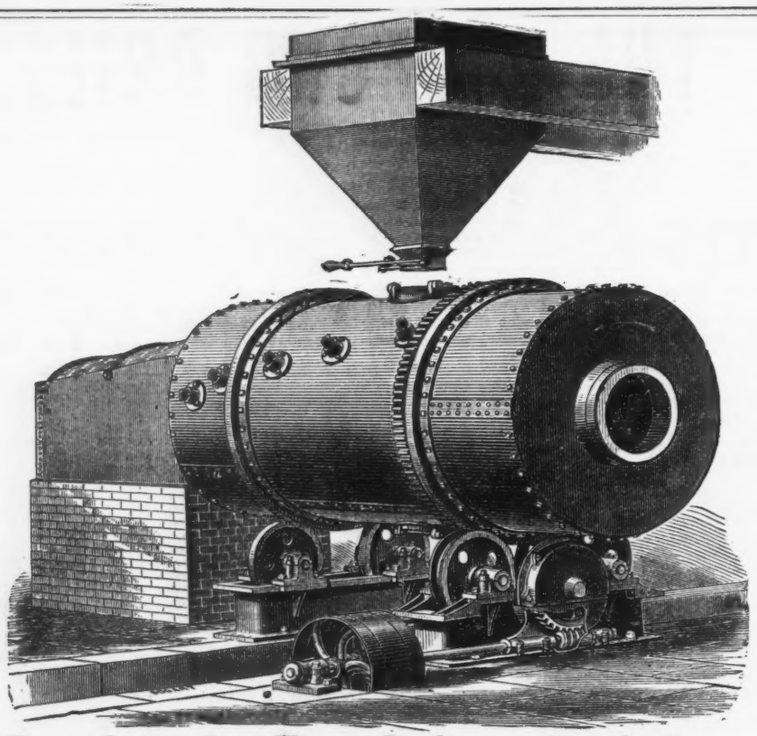
The Wellington and Copper Bay Mines have been worked for several years by the above named Company, and large quantities of copper ores—yellow sulphides occurring in quartz—have been produced, yielding, when dressed, from 18 to 23 per cent. in copper.

It is believed that with a moderate outlay of capital, the necessary works could be carried out for putting the mines again into a condition for producing large returns of ore, and for this purpose the Machinery and works already existing could be easily made available.

Tenders should be addressed to the Liquidator, JOSEPH GEORGE, Esq., No. 6 Queen Street Place, London; and will be received by him up to the 15th day of September next.

The Mines and properties may be viewed on application to the Agent in charge, Mr. G. H. PLUMMER, Wellington Mine, Lake Huron, Canada West; and further information may be obtained of the Liquidator in London, or of G. G. Francis, Esq., Montreal, Canada.

LONDON, June 26, 1877.



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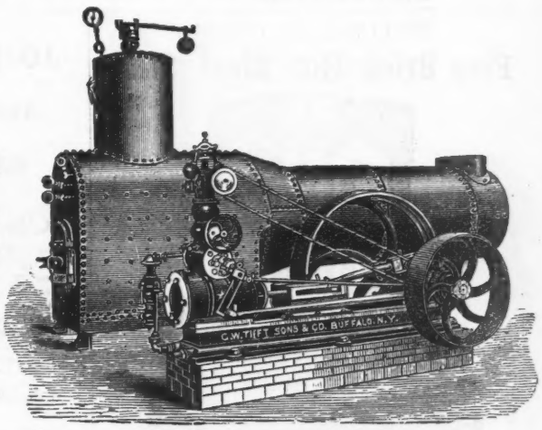

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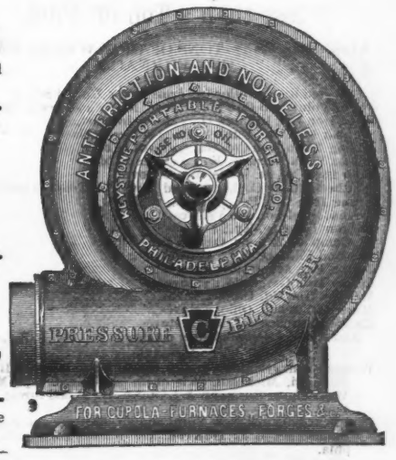

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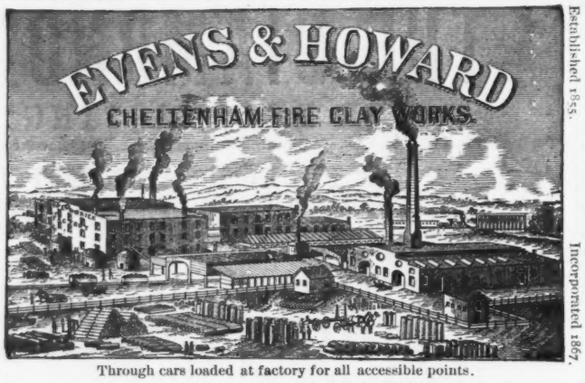

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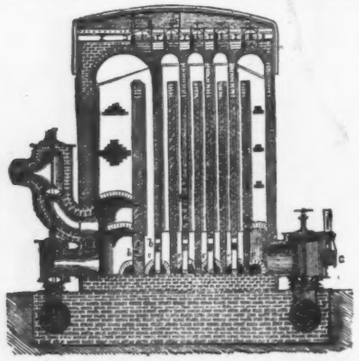

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Buena Vista Furnace, Ky., 3 stoves in blast.
Meir Iron Co., St. Louis, Mo., 8 stoves.
Southern States Coal, Iron, and Land Co., Tenn., 8 stoves.
Crane Iron Co., Pa., 3 stoves.
Penna. Steel Co., Pa. 3 stoves.
Norton Furnace, Ky., 4 stoves.
H. Campbell & Sons, Ohio, 3 stoves.
Ashland Furnace, Ky., 3 stoves.
Milton Furnace, Ohio., 3 stoves.
Ogden Iron Co., Ohio., 3 stoves.
Winona Iron Co. Ohio, 3 stoves.
Moss & Marshall, Ohio, 2 stoves.
Harford Furnace Co., Md., 2 stoves.
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